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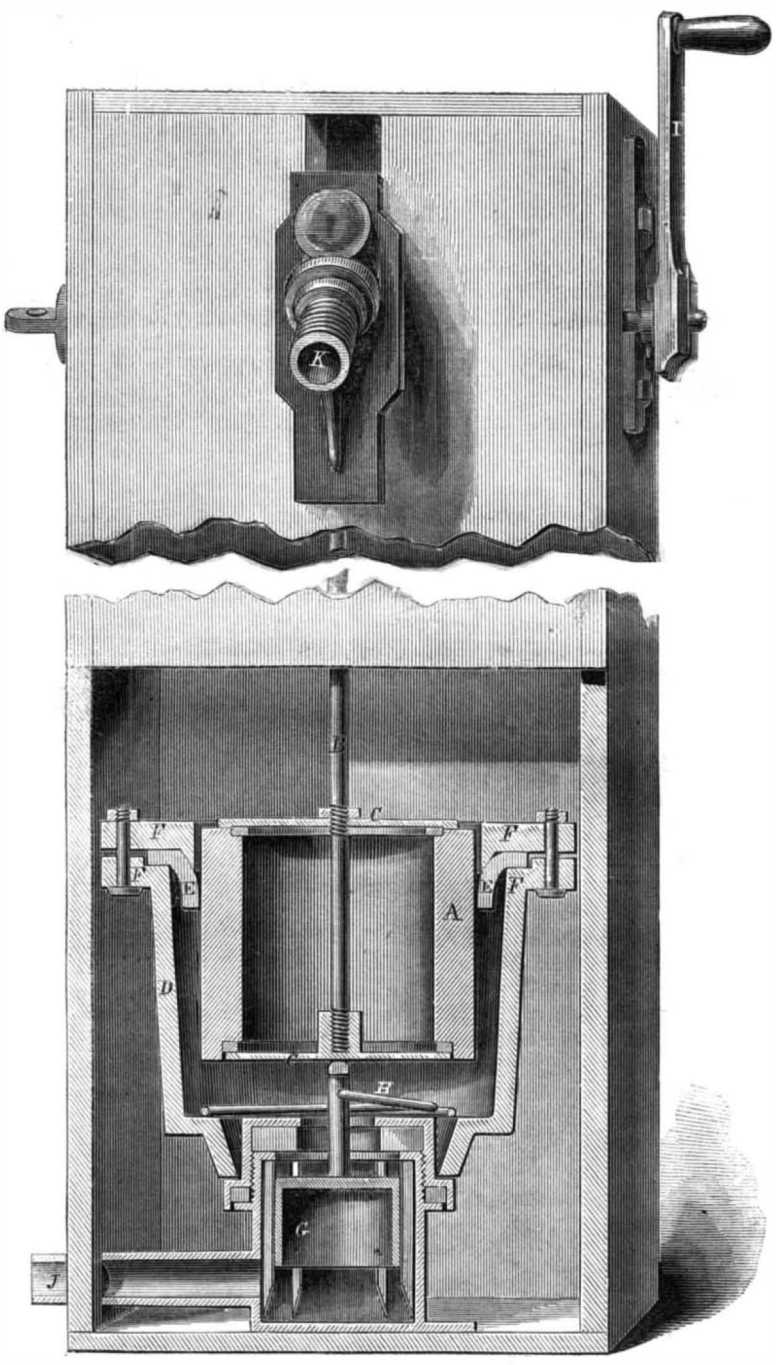
Non-Freezing and Non-Wasting Hydrant.

Street hydrants not unfrequently freeze up in consequence of the waste water collecting around the working parts, and these parts are continually wearing from the action of the gritty particles in the water, and thus causing the evil of leakage. Again, the constituent elements of some water act on metals, which derives an unwholesome property from them. The intention of the inventor of the hydrant herewith illustrated, is to obviate these difficulties, and he appears to have admirably succeeded. It is approved by the Water Board of Baltimore, where seven thousand of them are in use. One gentleman states that one of these hydrants has been in use on his premises for seven years, and has never frozen, nor required any expense for repairs.

The plunger, A, is a cylinder of terra cotta, or earthenware, with a glazed vitreous surface, secured to the rod, B, by means of the heads, C, packed with disks of rubber. It works in the case, D, and is made air and water-tight by means of the annular packing, E, secured between the rims, F. The valve, G, is cup-shaped, and has a stem projecting upward into the case, D, and is furnished at its top with a rubber disk, which closes the central aperture in the bottom of the case. A coiled spiral spring, H, retains it firmly in place. The packing, E, is covered with powdered soapstone, applied by means of warm gum. When water is to be drawn, the handle, I, is turned, which screws down the cylindrical plunger, A, on the stem, and depresses the valve, G. The water then enters the pipe, J, and the case, D, discharging through a pipe, its mouth shown at K.

The action of the spring, H, when the pressure exerted by the handle and screw is relaxed, is assisted by the upward force of the water, so that a close joint is at all times assured. The same pressure of water against the lips of the packing, E, increases the pressure of the packing against the plunger. Whatever gritty substances may be in the water are held by the packing, and do not injure the vitreous surface of the plunger. The taste of the water cannot be affected by the earthenware. All the working parts are readily accessible. They can, if necessary, be taken out and replaced, at any time, without breaking the ground, by means of a tool made for the purpose.



CLARK'S NON-FREEZING AND NON-WASTING HYDRANT.

Patented Sept. 3, 1861, by Lewis P. Clark. For manufacturing, State, or city rights, apply to G. W. Brooks, 248 Lee street, Baltimore, Md.

RULES ON THE METRIC SYSTEM.—A correspondent suggests that some of the manufacturers of carpenters' rules make a half-meter rule, folding in two. Closed, it would be two and a-half decimeters, and open, five decimeters, or 19.685 inches. It should be graduated to centimeters. These rules would familiarize the people with the new system and aid in its adoption.

The Effect of Sunshine on Fire.

At the meeting of the Scientific Association at Buffalo, Prof. Horsford, of Cambridge, read a very interesting paper on the above subject.

He commenced by alluding to the popular notion that sunshine deadens fires; mentioning that the fires in grates in rooms having southern exposures burn briskly in the early part of the day, slacken before noon, and revive again before sunset. Stoves and ranges that bake well in the autumn, winter, and spring, fulfill their office but indifferently in the middle of the day in the hight of summer. Some furnaces, in which iron is generally smelted without difficulty, cannot in very hot terms be brought to a working heat. While the popular mind ascribes these effects to some agency of the sun, scientific men are disposed to regard the effects as rather apparent than real.

The first recorded research bearing upon the subject, was made as long ago as 1825, by Dr. Thomas McKeever, who found, as he conceived, the popular impression sustained. In his experiments a given weight of wax taper was consumed quicker in the dark than when exposed to the sun. A given length of candle required less time for combustion in the dark than in sunshine. A given weight burned quicker in a paintedlantern than in an uncoated lantern, both alike exposed to the sun.

These experiments did not find acceptance with Gmelin, and did not appear in the original Hand Book of Chemistry, doubtless from a conviction that some error must have occurred either in the method or record of observation. Nevertheless, Dr. McKeever's experiments apppear as additions in the Cavendish Society's translation of the Handbook. The summary of his results may be stated thus: It required eleven minutes to burn in the sunshine the same weight of candle that burned in the dark in ten minutes.

Similar experiments were made at a later period by Dr. Morrill Wyman, of Cambridge, and reported to the American Academy of Arts and Sciences. The result at which he arrived was exactly the reverse of that reached by Dr. McKeever. He burned two sperm candles, each alternately for half an hour in the sunshine and darkness, and found the candle during its exposure to sunshine burned more rapidly than when in the dark.

In 1856 the subject was taken up by Prof. Joseph Le Conte, of Columbia, S. C. He concentrated, with the aid of a reflector and burning glass, the sun's rays upon the flame only of a wax (sperm) candle in a large dark room. At the same time another candle was burning in the same room, under identical circumstances, except that the flame was not exposed to the sun's rays. The result showed that the effect of the sun's rays, though greatly exaggerated by concentration, when confined to the flame, did not appreciably increase the consumption of tallow.

Here, then, we have apparently all possible results of experiment, to wit. Sunshine diminishing the rate of combustion, as observed by Dr. McKeever; augmenting the rate, as observed by Dr. Wyman, and producing upon it no effect whatever, as shown by Prof. Le Conte.

Dr. McKeever ascribed the retardation to some peculiar effect, as of interference of the solar rays upon flame.

Dr. Wyman inferred that the sunshine, by warming the tallow of the candle exposed to it, facilitated its melting, and by so much spared for destructive distillation and combustion the heat of the flame, which would have otherwise, in larger measure, gone to liquefy the tallow.

Le Conte exclusively showed that when the column of wax or tallow is sheltered and the sunshine directed solely on the flame, the effect on the consumption of the tallow is too small to be recognized.

The observations of the later experimenters agree

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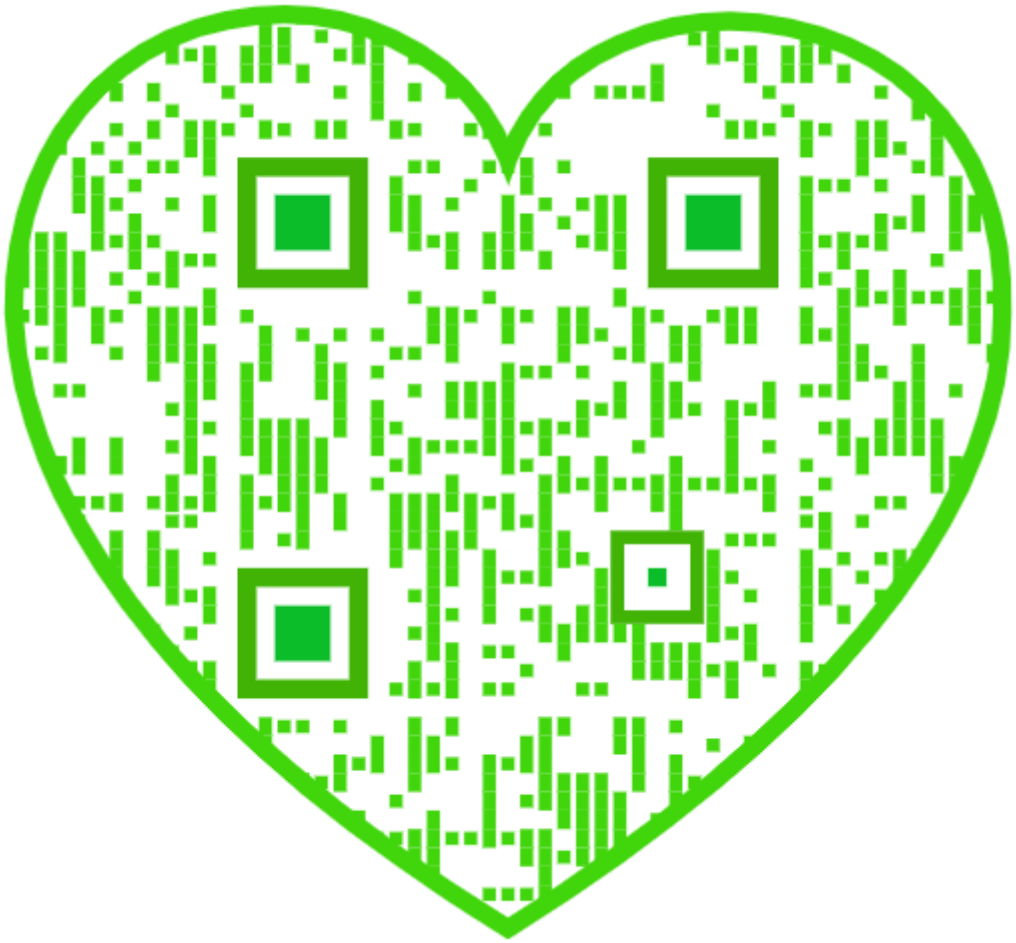

in throwing doubt upon the interpretation which Dr. McKeever gives of his own experiments.

Prof. Horsford then proceeded to detail a series of experiments he had made, showing the probable source of error in Dr. McKeever's investigation. He ascribes it to the incidental greater flaring of the candle in the dark. The experiments with the lanterns he explained by the well known effect of dark paint in absorbing radiant heat and converting it into heat of conduction, by which the air in the painted glass lantern was more heated than in the lantern that was not painted.

Prof. Horsford then gave an account of the diminished draft in the range flue of his dwelling house during the recent hot term, which rendered it impossible to bake meats or bread in the oven of his range. This continued from eleven o'clock to about three, within which hours bread could not be baked. With the decline of the sun in the afternoon, as in the early morning, the oven performed its office better.

The chimney was 54 feet high. The roof of the house was of dark slate. It was all exposed to heat before eleven. Some of it began to pass into shade about three.

In the effect of this greater exposure to the sun, during the hours when the sun was highest, Prof. Horsford found the explanation of the observed phenomenon. The heated top and sides of the house warmed the air in contact, giving rise to an upmoving column from the top of the house, and to an endless shroud of air sweeping up the sides of the house. This ascending shroud by friction draws the air from the cracks, doors, and windows of the house, lessening the pressure of the air in the interior, and, of course, diminishing the draft.

After showing the applicability of this explanation to the various cases that occur with dwellings, iron furnaces, etc., the paper concluded with the following summary :—

First. That sunshine falling on the flame only of a burning body does not affect its rate of combustion.

Second. That, other things being equal, neither light nor darkness exerts appreciable influence on the rate of combustion.

Third. That, other things being equal, of two samples of the same combustible, one burning in sunshine will consume more rapidly than one burning in darkness.

Fourth. That combustion during the winter is more vigorous than in the summer, because a given volume of air contains more oxygen—is denser and drier.

Fifth. That slight currents, by causing a flame to flare and come in contact with more air in a given time, cause more rapid combustion, and by presenting greater surface from which radiant heat issues to warm the combustible about to be burned, increase the rate of combustion.

Sixth. That the diminished draft of chimneys in very hot weather, when the general atmosphere is at rest, and the sunshine intense, is due to upward currents on the outside of the house, arising from the heated surfaces of the roof and walls, which currents, by friction, draw outward, through cracks and open doors and windows, the air from the interior of the house, and so lessen the pressure within and overcome the draft of the chimney.

Seventh. That the popular impression that intense sunshine lessens the draft of chimneys is founded in fact.

A Life-Saving Machine.

A new life-saving apparatus was lately tested near Boston, under the direction of Captain Fengar and Commodore R. B. Forbes. Commodore Forbes placed his mortar at Deer Island in position, and at the signal it was discharged, the hollow shell flying high across amidships and leaving the line in the rigging. It was quickly secured, and in a few minutes the larger line was drawn in, made fast, and the communication with shore thus secured. The life car, in shape like the Winans steamer, and made of painted canvas, stretched on a light frame, was hauled along side, into which two sailors were snugly stowed, through the "manhole," and in three minutes safely landed ashore. The experiment was entirely successful.

Enlargement Test for Ordnance.

At the Manchester, England, meeting of the Institution of Mechanical Engineers, Mr. Whitworth read a paper on the expansion of guns in firing and his device for the measurement of the bore. We find the following report in the *Engineering*. We refer to the statements therein contained in another column :—

"Mr. Whitworth's (the president's) paper expressed the opinion that the "best" proportion of a solid projectile was three diameters in length, and that a gun would properly consume a powder charge one-seventh of the weight of the shot. Why these arbitrary proportions were best was not explained, yet Mr. Whitworth applied them to the 13.3-inch gun, which, he said, should throw a 990-lbs. shot, and consume 141 lbs. of powder, while the American 15-inch guns should throw a 1,522-lbs. shot, and consume 217 lbs. of powder. Because neither of these guns could bear anything like such charges, their bores were pronounced "too large," and the guns themselves were "inefficient." These conclusions, or rather broad assertions, were not, perhaps, strictly covered by the title of the paper, and they were undoubtedly open to dispute. It will, we think, be generally agreed that the efficiency of guns should be measured by the total destructive power which they can exert without injury to themselves ; and we very much doubt whether, of two guns of the same weight, and firing the same powder charge and weight of shot, that with a small bore and long projectile would withstand as many rounds as the larger bore worked at a lower initial pressure, and giving more room for the due expansion of the powder gases. But to proceed to the measuring instrument. It was designed by Mr. Whitworth, in 1864, to ascertain the enlargement of the bore of the 70-pounder gun during the competitive trials of the special committee at Shoeburyness, the primary object being to test the amount of charge which any particular gun would bear without injurious disturbance of its parts. The instrument is simple enough, and consists of two tubes, one within the other, and both rather longer than the bore of the gun. To the inner end of the outer tube is attached a brass head with three arms, having each a groove upon its face, within which grooves radial steel "feelers" are set out to the exact diameter of the gun, by means of a screw of fine pitch on the inner tube, and which draws in a cone which sets out the "feelers." An index pointer on the inner tube moves in a slot cut in the outer end of the outer tube, and by the position of this pointer the exact gage of the gun is read off. The tubular measuring rod is supported within the muzzle of the gun by a grooved brass pulley, so that it can be moved freely backward and forward in the bore. The instrument would indicate to within the one ten-thousandth of an inch at any part of the bore. The exact measure of the bore at the middle of the length of the powder charge and at the middle of the length of the projectile were ascertained before commencing to prove a gun, and also after each successive charge, commencing with a somewhat small charge. As was to be expected, a small enlargement was found to take place with ordinary service charges, and irrespective of the decided enlargement due to overcharges. In the case of the 70-pounder gun, the measurements, taken during the firing of nearly 3,000 rounds, showed that the bore enlarged regularly with successive charges of 10 lbs. of powder and a 70-lb. shot, and this enlargement was attributed to the wear of the chamber of the gun by the action of the powder. In the first 2,886 rounds the enlargement of the diameter was 0.0198 inch. In the next 50 rounds—20 of them having been fired with 140-lb. shot and 20 with 280-lb. shot—the further enlargement was 0.017 inch, showing that nearly as much enlargement was caused by these 50 rounds as by the previous 2,886 rounds. The last 15 rounds—fired with shot of from 350 lbs. to 490 lbs. and five of them with an increased powder charge of 15 lbs.—produced a further enlargement nearly equal to that of the 2,886 rounds. The instrument thus afforded the same means of carrying out the test of guns as are now adopted in the testing of girders, in which the effect due to the test loads is observed, and the permanent set noted. One curious result noted was, that Mr. Whitworth had fired charges with 12-inch air space between the powder and shot, and without bursting the gun. It was enlarged, however, exactly at the base of the shot, where the force of the explosive gases was suddenly arrested in an accumulating wave of pressure. The same gun was next fired with 1 inch more of air space, or with 13 inches between the powder and the shot ; and here again the gun was bulged exactly at the base of the shot, or rather at that point, 2 inches from the base, where the full diameter of the well-known Whitworth 70-lb. projectile is reached. And between the distinct bulge due to the 12-inch air space and that due to 13-inch, the intervening inch along the bore of the gun was found to be parallel. Mr. Whitworth has begun to vent his guns with platinum, and this has stood 4,000 rounds, whereas the copper vents required to be replaced after only 200 rounds.

Breech-loaders and Patched Rifle Balls.

From "F. R.," we have received a communication in regard to an article in our issue of Aug. 11th, from "An Unbeliever in Breech-loading Fire-arms," which objected to these arms for sporting purposes, because the ball could not be patched. Our present correspondent claims to have constructed a cartridge which carries a patched ball, designed for breech-loaders, which makes this kind of arm the most efficient in use. The patch envelopes the bullet the same as in the muzzle-loader, and the ball is secured to the cartridge by looped cords. In the discharge of the piece, when the ball leaves the gun, the patch drops off, leaving the projectile unincumbered. It has received the approbation of all who have tried it. The advantages claimed are :—

First. The greased patch causes an even, smooth fit between the barrel and the ball ; prevents the irregular, vibratory motion of the bullet, and causes it to leave the barrel without that erratic jerk, with which the rough, naked ball leaves the rifle.

Second. The greased patch acts as a swab, effectually cleaning the gun, after every fire, from the foulness of the previous discharge, allowing, positively, no dirt to collect in the barrel. This alone renders the improvement invaluable. The bare, naked ball never did this ; it only ground or rubbed the dirt into the polished inner surface of the barrel ; at times clogging in the barrel, and bursting the piece, and at times, jumping and tearing across the twist, destroying the rifle. If any one will examine an ordinary breech-loader, which has been frequently used, he will find the interior of the barrel sprinkled with a nebulæ of rust. This oxidation is the result of the grinding into the barrel the acid foulness of the burnt gunpowder, and can be removed only by mechanical means. Compare with this the muzzle-loading, patched-ball rifle—smoother, brighter, better years after, than the day on which it was made, all because it uses the patched bullet.

Third. A rifle using the patched ball will not only shoot better, but will last a lifetime ; it will scarcely wear out, and is never leaded.

Fourth. With the greased patch, there is not so much force lost in overcoming the friction, and the force before so spent now assists in giving the ball a higher initial velocity.

Sawing Lumber.

A correspondent, D. L., of Vermont, who claims to have had many years experience in setting up and running circular saw mills, says that the "end play" delusion is still cherished by many in the Middle States, but in New England it is rejected. He says he is running a saw 50 inches in diameter, at 800 revolutions per minute, sawing spruce and hemlock, some of it very knotty, on one-and-a-half-inch feed ; and most of the lumber is sawed so smoothly that it is difficult to tell, by the appearance of the boards, how much the saw cut at each revolution. He thinks it would be impossible to run a 50-inch saw 800 revolutions where "end play" is permitted. If the power is limited, the speed should be reduced. It is better, he says, to run 400 revolutions per minute on one-and-a-half-inch feed than 800 at ¾-inch feed. It dulls a saw as much to saw 500 feet of lumber on ¾-inch feed, as to saw 1,000 feet on one and a-half-inch feed, and requires almost as much power, if the saw is in proper order.

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MEERSCHAUM AND AMBER.

Less than twenty years ago meerschaum was practically unknown in this country. The specimens that existed were in the hands of scientific men, or in the cabinets of travelers, who had gathered knick-knacks from every place they visited. Subsequently a sudden furor for meerschaum pipes seized upon the people, and now there is hardly a smoker who does not possess a cherished meerschaum, the changing complexion of which is an object of greater solicitude to him than the infant's first teeth to a mother.

Meerschaum—German for sea-foam—is a hydrous silicate of magnesia, the composition represented by the formula

$$Mg\ O, Si\ O_3 + 2\ H\ O.$$

It is of soft, porous texture, very light, but of varying specific gravity, and has a greasy feel. It is found in various parts of Southern Europe, in veins of serpentine and in tertiary deposits. It occurs also in Asia Minor. It is easily cut, and when first removed from the bed is of a cheese-like consistency. Frequently the meerschaum is too porous for manufacture into pipes, the principal use to which it is applied. It is capable of receiving a fine polish, and can be easily carved. The ornamentation of meerschaum pipes is, in Europe, a distinct branch of business, or rather a distinct department of art; for there is no substance, nor article of use and ornament, which receives more artistic finish than the meerschaum pipe. There is one now in this city, which, for its graceful form and elaborate carving, is valued at five hundred dollars.

The finished pipes are soaked, or boiled, in milk or wax, the fatty substances of which are absorbed by the meerschaum, and are acted upon by the nicotine of the tobacco, in combination with the heat of smoking, to produce the rich yellow and brown colors so much admired. Those which have been treated in milk have a rich, creamy white, while those which have absorbed wax are a delicate shade of straw.

The manufacture of the meerschaum for a cheaper quality of pipes is largely prosecuted. These artificial preparations are from the chips, or parings, of the natural mineral, which are reduced to fine powder, boiled in water, molded and dried. Sometimes, pipe clay is added to the mixture. It is said there is no certain test for distinguishing the artificial preparation from the genuine meerschaum. The first is generally heavier and of a more even texture, owing to the absence of foreign minerals frequently found in the latter. The manufactured meerschaum does not receive color so well as the natural block, and is liable to chip and scale.

Amber, so extensively employed as mouth-pieces for meerschaum pipes and cigar holders, is believed to be a fossilized vegetable gum or resin. Anciently a fabulous origin was attributed to it. As it was found on the sea shore after a storm, it was said to be the solidified tears of the sisters of Phaëton, or of sea nymphs. It is of a yellowish color, frequently streaked with milky white, the yellow color being semi-transparent. Those specimens which have a clouded-milky appearance are the most highly valued, as the clear yellow can be imitated by recent and cheaper gums. It is singularly electrical, when rubbed, developing negative electricity to such a degree that in manufacturing it into the forms in which it is sold the workmen are sometimes affected with nervous tremors, and they are obliged frequently to change the pieces they handle.

It is found on the Baltic coast of Prussia, either washed ashore after a gale, or entangled in masses of seaweed. Mines of it are also wrought in Prussia. It is found in this country at Amboy, N. J.; at Gay Head, Martha's Vineyard; and at Cape Sable, in Maryland. Leaves of fossil plants and tropical insects are sometimes found imbedded in it, a fact that has given rise to some pretty poetical conceits. In the East it is highly valued, and has been used as a form of concentrated wealth, as are diamonds and other precious stones. When heated, it exhales an agreeable odor, and for this, among other reasons, is in great request as mouth pieces for pipes.

TURKEY is about to convert its rifles into breech-loaders, and a thousand rifles have been ordered in England as experimental pieces.

The Corn Crop.

The crop of Indian corn in the United States in 1860, according to the census returns, was 838,732,740 bushels. Vast as was this yield, it bids fair to be largely exceeded the current year. From the increased breadth of the land under cultivation, and the generally favorable season, it is estimated that the crops of 1866 will reach 1,000,000,000 bushels, worth, at 60 cents per bushel, $600,000,000. This is truly a great wealth, and it is difficult to place a limit to the production of this cereal in our broad domain. It grows in abundance from Maine to Texas, though flourishing with greatest luxuriance in the Western States, side by side with wheat, where it waves its tassels and grows golden over prairies and broad fields, reminding one forcibly of incipient forests. Broad as are our acres, and extended our agricultural territory, there are few sections where corn cannot be profitably grown, while in most parts its production is enormous. The Commissioner of Agriculture reports the corn crop of the single state of Illinois in 1865, as 177,076,867 bushels, or nearly one-third of the entire crop of the country in 1850, which was 592,071,104 bushels. The cultivation of the corn crop, too, is attended with much less difficulty than it was fifteen or twenty years ago. The skill of invention and the hand of mechanical art have contributed largely to this result. There is not now that absolute need for careful manual husbandry which was deemed essential in former years. In the leading producing States, land well plowed, planted by machine, with a man and team, at the rate of many acres per day, and worked twice with an improved cultivator, is all that is now required, beside a good season, to insure a teeming harvest. In consideration of its utility, the corn crop is scarcely second to that of any other American staple. It is valuable for food, and is not only thus largely employed at home, but is annually used more and more in Great Britain and Ireland and elsewhere abroad. It makes the best of feed for stock; it is used to an enormous extent for the distillation of spirits, and it is claimed that a process has been discovered whereby it can be converted into sugar. In addition to the uses to which the grain can be turned, the stalks make excellent winter fodder, and return to the soil as much in the shape of fertilizing material, perhaps, as they take from it.

Thus year after year, the area of this great wealth enlarges, and it is difficult to say what untold millions are yet destined to be fed with this cereal from the lap of American agriculture. Let him who dreams of a "ruined country" look to its wonderful resources, and believe, if he can, that a land so infinitely endowed in natural wealth, and a people with such indomitable enterprise, can fail to make rapid strides in everything which pertains to material progress.—*Shipping and Commercial List.*

Hardening Long Planing Knives.

In No. 10, current volume, we replied to a question by W. J. C. of Louisiana, in regard to hardening and tempering long planing knives. Ede gives another process which may be better, but having never tried it we cannot fully indorse it. He says:

Lead is an excellent thing in which to heat any long plate of steel that requires hardening only on one edge; for it need not be heated any further than where it is wanted hard, and it will then keep straight in hardening. But if it is heated all over in a furnace and put in the water all over, it will be warped all shapes and cause a deal of trouble in setting straight, especially to those who are unacquainted with the setting of hardened steel. If it is heated all over, and one edge only dipped in the water, the edge that goes in the water will be rounding, and the edge that does not go in the water will be hollow; this is owing to the steel expanding in hardening, for the steel expanding in hardening causes the edge that goes into the water to get longer, and the other edge being kept out of the water, and still hot, the hardened edge expanding longer pushes the other part of the steel round, causing the edge that is out of water to be hollow. But if it is heated in red hot lead, and the edge only that is required hard put in the lead, the other part will be quite cold; and when it is put in the water all over, the hot part will not have sufficient strength in it to alter the cold part, consequently the cold part keeps the hardened part true.

MISCELLANEOUS SUMMARY.

THE delicacy of some of the ornamental cast-iron work, known as Berlin iron, is such that it requires of some pieces ten thousand to weigh one pound.

THE engines of the large ocean steamers make about 200,000 turns in crossing the Atlantic between Liverpool and New York.

IN 1814 the Barrowdale black-lead mine was assessed as worth £2,000 a year. It had been valued at 15s. 4d. two hundred years previously.

WITH four weights of respectively one pound, three pounds, nine pounds, and twenty-seven pounds, any number of pounds from one to forty may be weighed.

THE brilliant prismatic colors of the pearl are attributed to the decomposition and reflection of the light by the numerous minute grooves on its surface.

SWEDEN and Norway are slowly rising out of the sea at the rate of from one-tenth to one-half of an inch per annum. The west coast of Greenland is gradually sinking.

A SUCCESSFUL effort, it is said, has been made to raise vanilla in France. The experiment was made in the public gardens of the St. Bruno, and the quality is affirmed to be equal to the best imported from the West Indies.

OF the durability of timber in a wet state, the piles of the bridge built by the Emperor Trajan over the Danube afford a striking example. One of these piles was taken up and found to be petrified to the depth of three-quarters of an inch, but the rest of the wood was perfect.

TREATMENT OF ITCH.—The Prussian military authorities cure itch by smearing the parts with a mixture of two parts of liquid storax with one part of sweet oil. The cure is said to be complete in twenty-four hours.

BLAST furnaces are about to be erected in Oregon by the Oregon Iron Company. The works are to be located on the Willamet River, eight miles above Portland. Iron, timber, and water-power are plenty there. They will be the first blast furnaces in operation on the Pacific coast.

ONE of the largest bells in the United States has been cast for the city of Pittsburgh, Pa. The amount of metal contained in the rough casting is 7,200 pounds. It measures sixty-six inches across the mouth, and sixty-two inches in hight to the top of the crown.

DR. COQUEREL, a French naval surgeon, has published a curious article on the fatal results experienced, both in Mexico and in Guiana, from a species of fly, which deposits its eggs inside the human nostrils. Several soldiers have died of the consequences.

A LARGE CHEESE.—The Ingersoll cheese factory, in Canada, has manufactured a cheese which measures six feet eight inches in breadth, and three feet in thickness, and weighs three and a half tuns. It required thirty-five tuns of milk, the product of eight hundred cows.

VARNISHES.—Messrs. Wilson & Wood, of Philadelphia, Pa., have sent us some samples of photographic varnishes by Wenderoth, of that city. One sample is for covering and protecting photographs, drawings, and water-color pictures. Another sample is a mixed varnish for water colors, which greatly facilitates their use upon photographs, tracings, and surfaces which refuse to take colors readily.

AN employé of the Bavarian Mint has patented an improved process for silvering by means of a solution of silver in cyanide of potassium; the difference from the usual method consists in the use of zinc-filings, with which the objects are coated; when the silvering solution is applied, an immediate deposition of a much more durable character taking place. The filings are easily removed by rinsing in water, and may be used repeatedly for the same purpose. Metallic iron may be coated with copper in the same manner, by substituting for the silver a solution of copper in cyanide; and over this copper deposit, a coating of silver may be applied.

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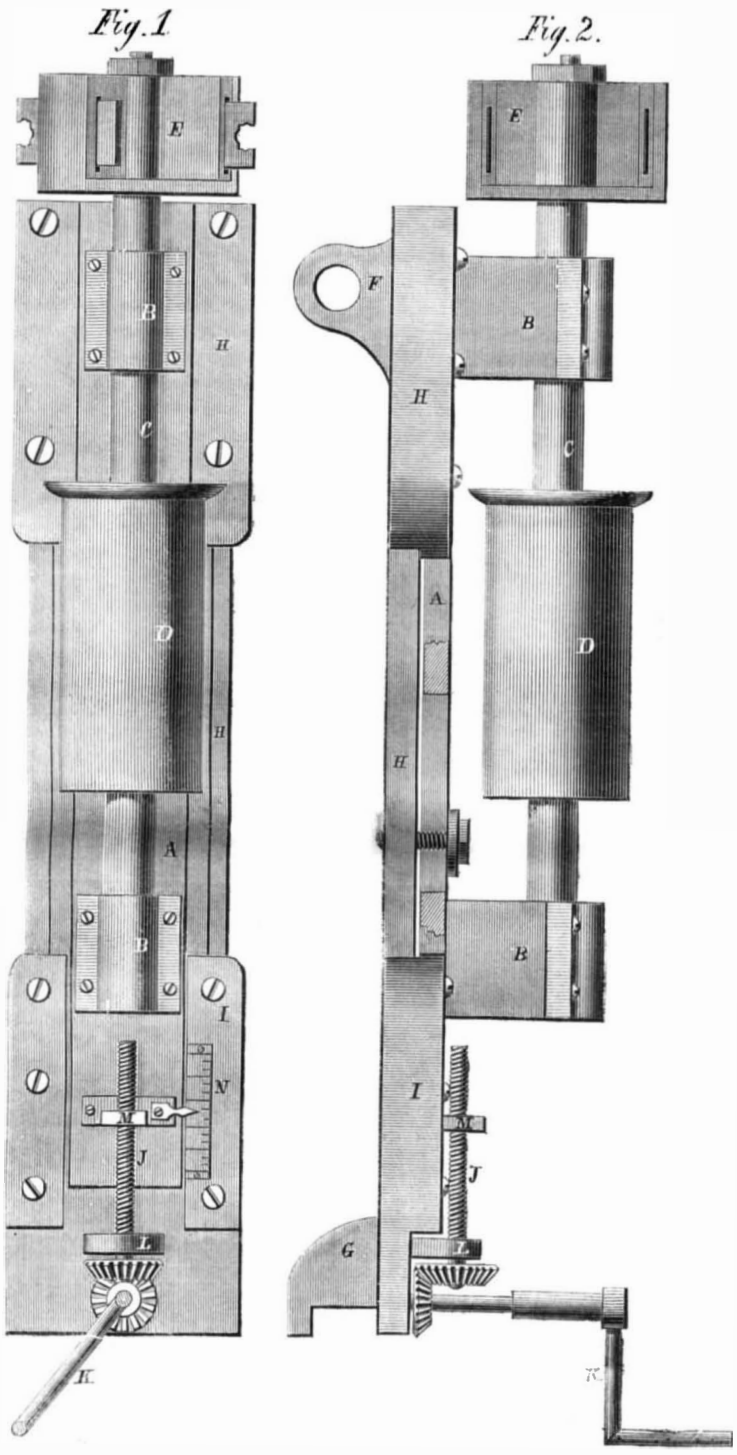
Improved Planing Machine.

Those who have used planing machines, or those for tonguing and grooving, know that the proper adjustment of the cutter head for varying thicknesses of stuff is frequently annoying, consuming time and increasing vexation. The engraving illustrates a device for obviating these difficulties, which appears to be thoroughly practical and efficient. The inventor is a practical man, who has been very successful in all his many inventions.

A is a frame, supporting, by means of the boxes, B, the driving shaft, C, with driving drum, D, and cutter head, E. It is secured to the frame of the planer, or machine, below the floor, or bed of the machine, by means of a set screw passing through the nut, F, and the whole attachment can be adjusted laterally for different widths by the set screw and the foot, G, which slides on a guide. The frame, A, is attached to the support, H, by means of dovetail groves at H and I, through which it slides up or down, on turning the screw, J, by the crank, K. The screw turns in a collar, L, and through the nut, M, raising or depressing the frame, the distance being graduated by the pointer and scale, N.

By means of these attachments the vertical and lateral set of the cutters is easily and quickly regulated for the differing thicknesses of lumber, whether the planer is in motion or not. The cutter head, E, can be run down below the surface of the planing bed when the machine is to be used for surface planing.

Patented through the Scientific American Agency May, 8, 1866, by Joseph Dixon, cor. 38th-st. and 1st ave., New York City, to whom all letters for orders or information should be addressed.



DIXON'S PLANING MACHINE.

The Power of Infection.

In our last number we published an extract from the report of William Crookes, which specified the nature of the infecting matter in the cattle disease. We make further interesting extracts:—

"There are weighty reasons for deciding that the infecting matter is neither a gas nor even a volatile liquid. The almost infinite attenuation which a gas undergoes, owing to its rapid diffusion into the atmosphere, would render its supposed noxious influence imperceptible a few yards from the focus of infection. Moreover, the infection is capable of being carried considerable distances in clothing or running water, and in a variety of ways incompatible with the behavior of gases. For these reasons, and many others unnecessary to adduce here, it seems clear that the disease must be communicated by the agency of solid, non-volatile particles.

"The specific disease-producing particles must, moreover, be organized, and possess vitality; they must partake of the nature of virus rather than of poison. (The words virus and poison are generally regarded as synonymous. It would be more convenient, and would tend to promote accuracy of thought, were the distinction here made generally adopted.) No poison yet known to chemists can approach, even in a faint degree, the tremendous energy of the active agent of infectious diseases. A poison may be organic, but it is not organized. It may kill with far greater rapidity than the virus of infection, but, unlike this virus, it cannot multiply itself in the animal economy to such an extent as to endow within a few hours every portion of its juices with the power of producing similar results. A virus, on the contrary, renders the liquids of an infected animal as virulent as the original germ. Strychnine may be regarded as the type of a poison, and vaccine matter as the type of a virus.

"Many considerations tend to show that the virus of cattle plague is a body similar to vaccine lymph, and consists of germinal matter, or living cells, possessing physiological individuality, which, if not exposed to extremes of heat, cold, or dryness, are capable of preserving their activity for a certain time outside the living organism, of adhering to material objects, and of being carried from one place to another by currents of air; each, when introduced into the blood, requires a certain time (known as the period of incubation) during which the septic germs develop and multiply, until they have so far poisoned the blood that the ordinary symptoms of disease become manifest.

"The blood poisoning thus set up may legitimately be called 'fermentation;' it is a decomposition caused by the act of nutrition of the living cell, whereby it reproduces in incalculable numbers the specific septic germs which have given it birth. These gradually infest the blood and other animal liquids, and, as the disease progresses, are discharged from the skin, throat, glands, etc., the breath, perspiration, and excreta of the animals forming vehicles for the distribution of the virus. By 'living' cells, is not meant living, in the sense in which an animal, or even a low form of infusoria, lives; but living as a seed, or as vaccine matter, even when dried, may be living, inasmuch as it still possesses reproductive vitality.

"It is by no means certain that the multiplication of these individual cells is the immediate cause of the blood poisoning. The analogy of the action of virus on the blood, to that of yeast on sugar, renders it more probable that this is not the fact. In the case of the best-known ferment—yeast—its cells multiply by feeding upon the sugar in the liquid; alcohol and carbonic acid being their excretions. It is, therefore, probable that during the multiplication of the virus cells, they, in a similar manner, impoverish and weaken the blood, by feeding upon some element in it, while at the same time they excrete a poison to which the symptoms of the disease may be immediately due."

The Atlantic Cable.

The great question that remains for time to solve is the probable duration of the cable. No similar wire has ever lasted more than a few years, but many of the conditions of an Atlantic cable are more favorable to longevity than those of any rope previously submerged. In the first place the manufacture has been more perfect, and the tranquillity of the deep ocean gives an additional expectation of life to the cable. Still, no very prolonged existence in working order can be predicted until it shall be found practicable to lay a much heavier wire than that which now traverses the Atlantic. All past experience shows that a very thick cable may be trusted to last for an indefinite time, while those of less bulk are always in danger of fracture from the gradual rusting of the iron casing at points where a considerable strain may exist. A thoroughly satisfactory Atlantic cable will never be submerged until we have two *Great Easterns* to divide the work between them; but if the new line lasts in good condition even as long as the fractured wire of last year, enough will have been done to insure the ultimate establishment of permanent telegraphic communication across the Atlantic. It may be hoped that the comparatively slight cable which has just been laid will have, at any rate, years enough of life in it to insure to the enterprising promoters of the scheme the pecuniary reward which they have so well deserved.—*Saturday Review.*

Filling for Millstones.

We condense a communication on this subject from Wm. Kevill, of Sterling, N. Y. He uses for the purpose pounded burr block, alum, and gum arabic:—"First dissolve the gum arabic in hot water, as thick as you can obtain it; then melt the alum, and after it is melted, stir in the gum arabic. Next stir in the burr block till about as thick as you can work it; then fill the seams and holes with it while it is hot.

"When cold, it will be quite hard and tough. The gum arabic toughens the alum, and the burr block saves it from wearing away. If there are any large spaces to fill, I would fit in as large a piece of the burr as I could, then cement it in with the above mixture, and face it even with the stone. Alum alone soon melts with the heat of grinding, and wears away; pounded brick adds a little to its durability; dry sand is a little better, but the burr maintains the best face of anything I ever used, or saw used. Lead is not used in this part of the country for such purposes. I should hardly suppose that a miller would think of using such a substance."

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HAGENMEYER'S IMPROVED OIL CUP.

The valves and pistons of steam engines, although partially lubricated by the steam, sometimes require oil, and it is not easy to get the oil in against the pressure of the steam by one operation. There are a number of devices in use to obviate this difficulty. That shown in the engravings appears to be as effective and simple as any, and is some respects is decidedly superior. The steam can in no case force the oil out over the person of the operator, and the lubricating material, whether oil or tallow, must find its way to the steam chest and cylinder.

The receiver, A, by means of a shank, screws into the globe, B, which is secured by the shank, C, to to the steam chest. The stem, D, is a valve at its lower end, which is seated into the shank at E. The lower stem, F, is also provided with a valve, G, seated in the shank of the globe, B. These parts are common to both figures in the engraving, but Fig. 1 shows one method of operating the valves, and Fig. 2 another. The lower stem in Fig. 1 has a screw thread on its upper end, which works in the shank,

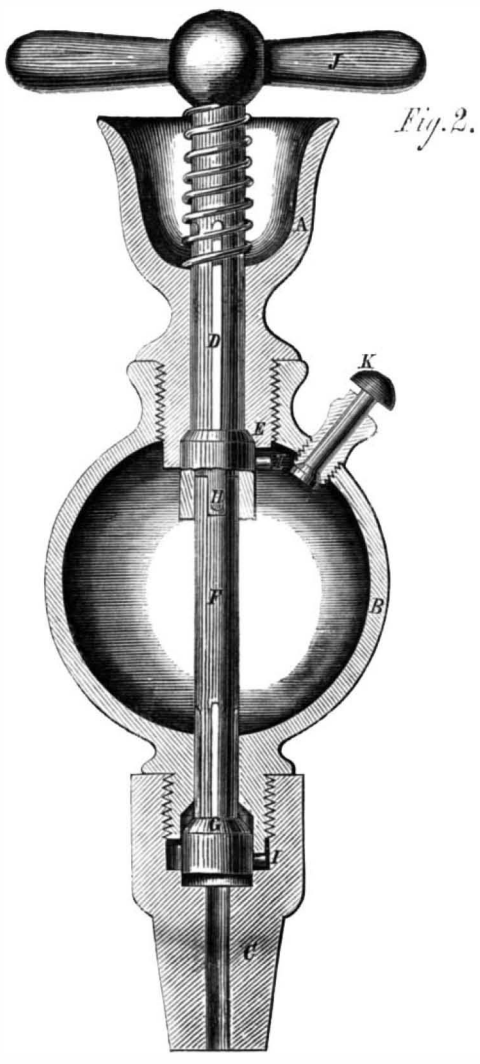

Fig. 2.

D. This lower stem is prevented from turning by a pin, H, passing through the recess, and seated in the shank, C. The recess permits a slight upward and downward movement of the valve, G, while it prevents its turning. By screwing the upper stem, D, on the lower stem, which is done by a half turn of the handle, I, the valve, E, is unseated, allowing the oil or melted tallow in the cup, A, to descend into the globe. But the same movement which opened E, by the depression of the valve, closed G by its elevation. By reversing the motion of the handle, I, the upper valve is returned to its seat,and the lower one opened, permitting a communication between the globe and the steam chest, or other part to be lubricated. A pet valve, J, permits the escape of the atmospheric air, or steam, that may be in the globe. It is worked by pressing on the button with the thumb. The spiral spring, K, returns it to place.

Fig. 2 is a simpler form of the oiler. The two valves are connected by means of a pin, H, passing through the stem, D, and through a slot in the stem, F, which allows either of the valves to rise and fall a little way, independent of the other. The lower end of the shank of A, and that of B, is formed into an incline or spiral plane, against which the pins, I, in each of the valves, work. These inclines run in opposite directions, so that when the handle, J, is turned, E will be forced open, and G allowed to close. The operation can now be readily understood. It is precisely like that of Fig. 1. The valve rod,

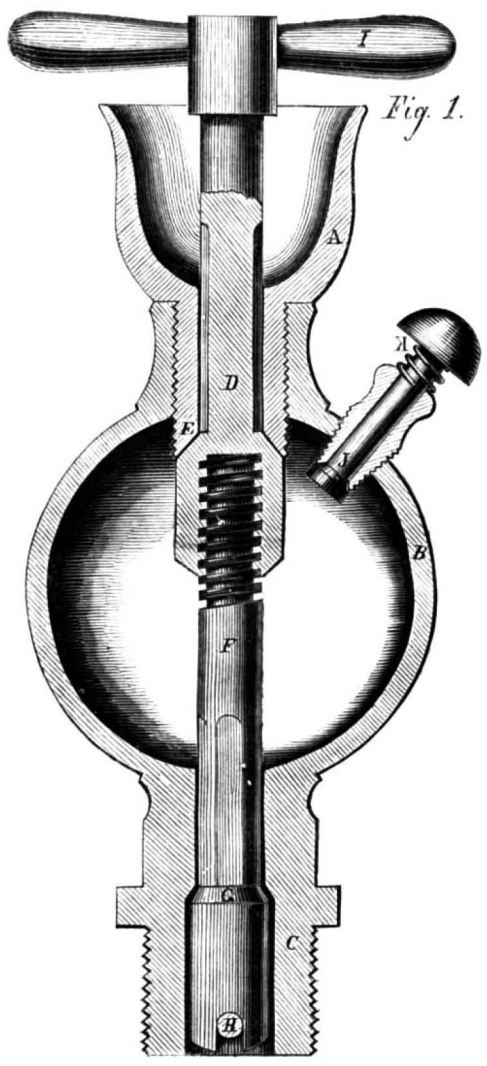

Fig. 1.

D, in Fig. 2, is furnished with a spiral spring which keeps the valve closed except when rotated. The pet valve, K, is operated by turning, having a pin and incline similar to those on the valves, F and G.

Patented Aug. 8, 1865, by Gebhard Hagenmeyer, of Big River, Cal.

The Lindner and Remington Rifles.

The new systems which may soon have a practical trial on the battle field are those of Lindner and Remington, a description of which will, doubtless, be acceptable, considering the excitement breech-loaders are now causing. Lindner's principle, in its application to the Australian rifles, may be briefly described as consisting of a breech plug having a screw cut on its exterior to fit a corresponding female screw in the barrel. Longitudinal grooves are cut through the threads from end to end of the screwed part, both of plug and barrel, thus enabling the former to be thrust into its place, the parts of its threads left standing passing down through the grooves cut in the barrel, and *vice versa*. Arrived at its place, one-sixth of a turn to the right given to the plug by a small lever outside causes the screws to bite, and tightens the whole arrangement. No alteration is required in the lock, and the percussion cap is still retained, but is used in a modified manner, being pressed into a hole prepared for it on the back of the cartridge. The pouch is thus done away with, and the soldier has only to seek for his ammunition and press its end containing the cap on the nipple, which is roughened to retain the cap, before putting the cartridge into the rifle. It will thus be seen that the Lindner system of ammunition lies between the ordinary capping arrangement and the principle of carrying its own ignition. The Remington rifle is a recent introduction from America, and possesses the merits of being very simple in construction and having but few parts. The barrel is bored completely through, and has its rear end closed, when ready for firing, by a pivoted breech piece. This breech piece, the hammer, and the trigger are the only three movable parts, and in this the simplicity of the arrangement lies. Provision is made for locking the hammer while the arm is being loaded, so that the trigger cannot be moved until the end of the bore is properly closed by the breech piece. On firing the gun the hammer falls upon a projection on the side of the breech piece, and supports the latter during the time of discharge. We hear that this gun has recently made some good practice, having been fired 20 times in 69 seconds; this, from its simplicity, it ought to do, and for rapidity no doubt it would stand well. But we have our misgivings as to the escape of gas, and more than all as to the power of the hammer to retain the breech piece against the rear end of the barrel during discharge. In fact, we have been informed that an accident has already occurred by the discharge forcing the block and hammer back. In construction, too, the gun appears exceedingly weak at the junction of the breech with the stock, the wood being cut away to a considerable extent.—*Mechanics' Magazine.*

The Peat Manufacture.

This subject is arousing a deal of attention all over the country. Last week several gentlemen were in this city purchasing engines to drive machinery for manufacturing peat at the Great Dismal Swamp, Virginia. They represent a company formed in Massachusetts for this purpose. One of them stated that the deposits of peat in the Dismal Swamp are practically inexhaustible. They will commence operations with six engines.

Undoubtedly there is much value in peat as a fuel, but it is possible that its importance as a substitute for coal is over-estimated. Where peat is found, and coal does not exist, it is doubtless true that the former is the cheaper fuel; but when it is to be brought from its place of production or manufacture, it may be problematical whether it could be afforded as cheaply as coal transported the same distance. The price of coal at the mines is almost nominal. Its cost to the consumer at a distance is the cost of transportation, mainly. Certainly, the cost of transporting a tun of peat must be greater than that of coal, because of its greater bulk, and it is certain that the first production and subsequent manufacture of peat cannot be much less costly than the mining and screening of coal. We think it will be found that the manufacture of peat will not greatly affect the price of coal, except in localities where there are easily-accessible deposits of this combustible turf.

A. H., of Pennsylvania, sends us a copy of a photographic group of six young men, each having upon his head a stove-pipe hat. The position of the group is such that, in some instances, the face of one of the individuals is directly behind, and covered by, a hat in front. One of the faces of the party is seen through the hat in front, which conveys the idea of a transparent hat. On the back of the picture is printed the following affidavit, purporting to be sworn to by the six:—

The undersigned being duly sworn, depose and say, that the photograph on the reverse was taken without any attempt at fraud or deception; the transparent hat being a common cassimere hat, and no opera or glass hat, and was not moved durin the process.

Our correspondent says:—"I am anxious to know how it is possible that, under the existing circumstances, the photograph can show the face of one gentleman through the hat of another. If there had been anything of the mirror nature in the room, it might not be so hard to explain."

The "transparent" hat evidently had a movable crown, which was put on after the face behind had been partly photographed. It would be difficult to explain how a mirror could have been used.

LATIN.—If any body wants to commence the study of this interesting and time-honored language, we advise them to take up Harkness's Introductory Latin Book. It is a small work, but is wonderfully comprehensive and thorough. Published by Appleton & Co., New York City.

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Correspondence

The French Exposition.

MESSRS. EDITORS:—I take pleasure in informing you that the immense structure in the Champ de Mars, designed for the Exposition next year, is progressing satisfactorily, and no fears need be entertained by our fellow countrymen in regard to the will or the ability of this Government to have it in complete order at the time specified.

It will cover forty-eight acres of ground, and is about half finished, but already shows, in its rough state many marks of the bold designs of its architects.

Seventy-five acres of land immediately surrounding it are to be made into parks, and a liberal portion of the same will be known as the "park of the United States of America." This land, although unpromising in its appearance at present, will be rapidly transformed into graveled walks, beautiful flower beds, and picturesque fountains.

The astonishment and admiration of the nations of Europe, which we have won for ourselves by our military achievements, will here be increased by a proper display of the products of our genius and industry, showing that the arts of peace have not languished during the triumphant progress of the arts of war. You will readily see that it will be quite desirable for Americans exhibiting articles designed for sale, to secure the services of some one here acquainted with the different European languages, that our commerce may not fail to derive the immense benefits which are likely to follow from our products being properly presented and explained to the numerous peoples who will here be gathered from every portion of the globe.

JAMES W. TUCKER.

Paris, Aug. 10, 1866.

Insulation of Lightning Rods.

MESSRS. EDITORS:—It is a common error to suppose that lightning rods should be insulated, and a very natural one, arising from a superficial view of the subject. It should be remembered that currents of electricity in a rarified state are continually circulating through masses of matter, silently and without producing any manifest effects; the effect of insulation is to interrupt the flow of these currents, whereas the lightning rod ought rather to be so contrived as to facilitate their free passage from the building to the rod, and thence to the atmosphere, and *vice versa*.

During that disturbed electrical condition of the atmosphere which we call a thunder storm, these currents circulate in greater volume and rapidity, and a sufficient interruption of them brings about a discharge of lightning. At such times the insulation of the rod from the building is a most excellent device for causing an explosion of accumulated electricity either from or into the building, as the case may be. The rod, on the contrary, ought to act somewhat as a safety valve as regards any electrical disturbance within the house, neutralizing it gradually, and thus preventing an explosion. Should the rod be struck by lightning, its efficiency in carrying off the shock will depend on whether it presents a continuous chain of conducting matter in the line or direction of the discharge, which is superior to anything within the building. If it does not, all the glass in the world will not prevent fluid from leaving the rod and passing through the building on such conductors as it may find there.

The true theory or purpose of the lightning rod is to facilitate electricity in following out its natural laws and tendencies, and nothing can be more truly unscientific or practically absurd than the idea of presenting a barrier of obstruction to lightning.

A lightning rod of proper construction, therefore, is a sort of safety valve as regards electricity. To insulate the rod, is to tie down the valve. It should never be insulated. It may be fastened to the building with brackets of wood, or staples. In the application of the rod to the building, the conducting power of the building should be brought into the general line of conduction: that is, the rod should come in good metallic contact with all the important meralliic substances upon the outside of the building, such as gutters, spouts, etc. Dr. Franklin, and Prof. Olmsted, of Yale College, bear testimony in favor of non-insulation, and the same view is taken in the "Cyclopedia of Useful Arts," and Appleton's "Dictionary of Mechanics." S. D. CUSHMAN.

New Lisbon, O.

Wood on the Prairies.

MESSRS. EDITORS:—The *savans* appear to be in a strife to see who can invent the most ridiculous theory to account for the Western prairies being destitute of timber; they frequently get up a new theory, but get further and further from the truth each time. At the fifteenth meeting of the American Association for the Advancement of Science, Professor J. S. Newberry presented a paper "On the Origin of Prairies." The Professor said, that the presence or absence of forests, as a general thing, depended on the amount of precipitated moisture, and that the central portions of this continent were comparatively dry, and consequently treeless, except on the mountain belts, which acted as a condenser, and precipitated an amount of water which would sustain a forest growth.

He also said, that the many theories which attribute prairies to other causes than the want of water are wholly erroneous, or only of local value. Well, his theory only proves that "New Berries" are very apt to be green. The cause of prairies is nothing but a local cause. We know that timber grows on all poor soil, either East or West, without any precipitating condenser, as he describes. In the Western country, there is timber on all islands, without a failure, not on account of any precipitated, or other moisture, but because the water prevents the fire from getting on the island to burn up the timber. The timber is also allowed to grow between forks of streams from the same cause, and timber is always present there. All side hills bordering streams are also covered with timber, because the rich soil is washed away, and it is comparatively poor land, which cannot produce much grass or weeds, and consequently the fire dies out when it comes to such ground for want of fuel, and thus also is the timber protected on the rich valleys between.

There is, another grade of better land, which, though not as rich soil as the prairie, can produce a sufficient crop of grass for fuel to kill all timber except burr oak every time a fire is started, and this is the cause of what are called burr-oak openings. Burr oak has a thick, rough outside bark, which protects the inner or living bark, and enables it to live through a fire that actually kills all other timber. Then, in any direction from the burr-oak land, whether up the side of a mountain or on a plain, just as soon as the land grows poor and fails to produce the necessary amount of fuel hinted at, just then and there other kinds of timber commence to mix in.

Every acre of land in the Western States that is as poor soil as the land in the Eastern States is covered with timber, and that without a failure.

Land in the Eastern States, if manured and beat up to the producing capacity of the Western prairies, would then produce a heavy crop of grass, and such grass, if dry and set on fire, would kill all timber, and if the same thing were repeated each year, of course there never would be any timber on such land.

The rich prairies grow sufficient fuel to kill all kinds of timber when the fire is started, and that is all there is about it. PERRY DICKSON.

Jersey City, Aug. 25, 1866.

Timber on the Prairies.

MESSRS. EDITORS:—It is an erroneous idea that the Western prairies will soon be covered with timber where the annual fires are kept back. There are large tracts of land in this country, known as "barrens," of the same character as the oak openings of Wisconsin and Michigan, covered thickly with stools, which are not seen in summer on account of the grass. If fire is kept from these barrens, immediately every stool sends forth shoots, and what appears to a stranger as prairie, with here and there a tree or shrub, is soon covered with the thickest kind of a growth of timber. The genuine prairies are as entirely destitute of trees, stools, or shrubs as they were twenty years ago. Where timber and prairie adjoin, there has been no encroachment by the latter upon the former. Thousands of acres of barrens, during the same length of time, have become fine groves of timber. Cottonwood makes its appearance in cultivated fields, growing from the seed, which the wind scatters over the whole country. These are the only trees seen upon the prairie not planted by the hand of man. E. H. ROOD.

Bloomington, Ill., Aug. 6, 1866.

Cement for Millstones.

MESSRS. EDITORS:—The question of a cement for millstones has not, as yet, met with a satisfactory response. It seems to be one on which the millers are very taciturn. Although not a miller, my profession demands an intimate knowledge of the best cements, and I send you one used exclusively by millers of my acquaintance. Take of alum 1 lb.; yellow ocher, sufficient; melt the alum in its water of crystallization, and stir in the yellow ocher, in fine powder, until of the right consistency (about as thick as batter, or so thick that it will just flow), and pour while hot into the cavities.

There can be no poison here, for the composition of yellow ocher, which I give below, shows that it is a silicate of iron and alumina, with a trace of magnesia.

YELLOW OCHER.

Sesquioxide of iron	37·76
Alumina	14·21
Silica	33·23
Magnesia	1·38
Water	13·24
	99·82

This will give a hard and satisfactory cement.

SAMUEL P. DUFFIELD.

Detroit, Mich.

Saws--Lateral Motion.

MESSRS. EDITORS:—Having read a large number of opinions and experiences on keeping circular saws in order, I wish to say a few words on the subject.

I consider lateral motion unnecessary. The saw must be round, and the teeth must have set enough to run free in whatever timber you have to saw. Bend the teeth, if you choose, or upset altogether; but if you bend the teeth, you must upset enough to keep the corners, or points, full. I prefer both to bend and upset, because it will not wear down the size of the saw so fast as to upset alone.

The speed of the saw is to be governed by the number of teeth in the saw, and the kind of timber to be sawed. I find that a slow motion for soft, woolly timber, such as cottonwood, linden and elm, especially where knots and crotches are plenty, is best. I am running with less speed than Mr. Pettigrew recommends. My reason for running slow is, that in the knots of soft timber the rim of the saw will heat, but much less with a slow than with a fast motion. I feed 1¼ inches to the revolution with 18 teeth in a 50-inch saw, running 300 per minute, and cut from four to five thousand feet in eight hours, actual cutting, in elm and cottonwood. In pine, or other clean timber, I should double my speed, and perhaps use less teeth.

S. L. LOVELAND.

Marshalltown, Iowa, Aug. 13, 1866.

How to Banish Fleas.

MESSRS. EDITORS:—On page 82, current volume of the SCIENTIFIC AMERICAN, under head of fleas, you request information on the efficacy of pennyroyal to destroy these pests. Having had some experience on this subject, I give it to you for the benefit of your readers.

Much the largest number of these insects are brought into our family circles by pet dogs and cats, and the pig sty is generally filled with them at this season of the year, where numbers will hop on to you when visiting it for the purpose of feeding or inspection.

The oil of pennyroyal will drive these insects off; but a cheaper method, where the herb flourishes, is to throw your dogs and cats into a decoction of it once a week. Mow the herb and scatter it in the beds of the pigs once a month. I have seen this done for many years in succession. Where the herb cannot be got the oil may be procured. In this case, saturate strings with it and tie them around the necks of dogs and cats, pour a little on the back and about the ears of hogs, which you can do while they are feeding without touching them. By re-

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peating these applications every twelve or fifteen days, the fleas will flee from your quadrupeds, to their relief and improvement, and your relief and comfort in the house.

Strings saturated with the oil of pennyroyal and tied around the neck and tail of horses will drive off lice; the strings should be saturated once a day.

O. T. GIBBS.

Augusta, Ga., Aug. 14, 1866.

Simple Code of Signals.

MESSRS. EDITORS:—Having noticed in your issue of Sept. 1st., a letter from Mr. G. C. Round, late Signal officer, U. S. A., urging the necessity of a universal code of simple signals, adaptable to all situations, I beg to say that during the first year of the Rebellion, having invented a system of cast-iron embrazures, for earth works, and sea-coast defenses, which was favorably reported upon by Admiral Dahlgren, of the Navy, and Col. Alexander, U. S. Engineers, a system of signals became necessary for the use of such forts, and after a careful investigation of the various systems in use, I found their complication such as to be entirely beyond the comprehension of the temporary soldiers and sailors, who formed the bulk of our army and navy at that time. I therefore had to devise one, requiring only a knowledge of the alphabet and numerals, and involving the fewest possible flags and signs and the simplest combination of colors.

I found that by means of a red, white, and blue, and a diagonal of red and white flag, four flags in all, a four-sheaved signal block and halyards and a flag staff, all the letters of the alphabet, any combination of numbers from 1 to 100,000,000, might be clearly signaled almost as quickly as they could be read or written, all the flags being run up at once and not lowered or unbent till the operation was over, to make any letter or number it being only necessary to change the relative positions of the flags by hauling them past each other.

The absence of expense and simplicity involved in these signals bring them within the reach of every little fishing smack and coaster, from whom, in time of war, the most valuable information is to be obtained, and as the entire code is arranged to be printed on the face of a compass card, or painted within the binnacle or on the bulwarks, being continually in view, in a short time it would become as familiar to every cabin boy as his A B C.

For night signals, any number from 1 to 10 might be made by four ordinary lanterns placed or hoisted vertically or horizontally, and any letter or any number from 1 to 100,000,000, by five lanterns.

During fogs, guns fired, bells struck, or steam whistles blown, with pauses corresponding to the spaces between the lanterns, served the same purpose.

For boat service, or in situations where bunting cannot be used, a man, by placing himself in twenty-six easy positions, corresponding to letters of the alphabet, could converse with another, as far as these positions could be distinguished by the naked eye or a telescope.

For the use of the navy, a code book being necessary, I took Webster's Abridged Dictionary and numbered every word from first to last. Then by using my numeral 4-flag signals, the President's Message might be telegraphed almost as quickly as by the wires. This also I proposed as the basis of a universal code. The Japanese have only to take the dictionary, put the equivalent words in Japanese, and they could converse with one of our ships without difficulty, and what is better, understand what they were doing and saying. In short, these four simple pieces of bunting might be made the basis of a universal language.

When secrecy is required, the cipher disk, referred to in your issue of June 9th, serves the purpose more effectually than any combination depending upon human thought, which is never without bias and sequence, and therefore liable to be deciphered by some other mind skilled in the art. This little disk for manufacturing ciphers is peculiarly applicable for messages by the Atlantic cable, figures being substituted for letters. Thus, let two parties take a pair of similar dictionaries, number the words according to their fancy, and then arrange their respective disks, and their communications can never be deciphered if not repeated too often previous to a change of cipher. Pike & Co., on Broadway, and Tagliabue, on Pearl street, opticians, manufacture these disks for a trifling sum.

In conclusion, the above-described system has been submitted to competent judges in the United States Navy, and has received their unqualified approval. It will shortly be laid before the Board of Trade, in New York, and the proper authorities in Washington, when I hope that, if common sense, simplicity, and absence of paraphernalia and expense count for anything, it will be favorably received, if not adopted. J. WYATT REID, Consulting Engineer,

104 Pearl street.

Safety Valves.

MESSRS. EDITORS:—In your paper of July 14th, I noticed an extract from the report of the Manchester Boiler Insurance Company. A remark in that report relative to a spring on the top of the safety valve, its danger and inaccuracy, leads me to mention a great fault which exists in our present mode of using a spring balance attached to the lever at one end and at the other to some fixed point. I have noticed that when the steam is blowing off or escaping by the valve being lifted, the balance registers, and there actually exists, a greater pressure on the valve than is desired. For instance, your lever is screwed down to one hundred pounds and the lever from the fulcrum to the balance connection, or point of resistance, is fifteen inches long. Now, to enable the steam to escape when it arrives at the above pressure, the valve must lift. Now supposing that lift to be only one-sixteenth of an inch, and it is generally more, the lever at the point of resistance will move fifteen-sixteenths, or very nearly one inch, which, of course, compressing or elongating the spring of the balance, increases its power, thereby preventing it from acting as a dead weight, as generally supposed. It seems curious that this has been so long overlooked by our practical mechanics, as it can be prevented by making the lever with a double fulcrum. As the lever lifts, of course the inside or short end going down, becomes still shorter, thereby decreasing in power as the spring increases, which by some little experimenting in the proper length of lever to equalize the increased power of spring, will, I think, make a perfect balance, and indeed act as a dead weight. Probably you or some of your numerous correspondents will be able to inform me whether such a balance has been before thought of or made.

EDWARD SAMUEL, Mechanical Engineer.

Philadelphia, Aug. 20, 1866.

An Idea.

MESSRS. EDITORS:—Associated effort with division of labor is a principle indissolubly connected with human progress. Two old men touching hands could reach back to the time when a public mail between London and Edinburg was a doubted experiment, and when the only light in the street was the uncertain flicker of the torch-bearer.

Might not the principle be applied with advantage in civic architecture, where material, labor, and space could be greatly economized by a degree of unity and cöoperation in the building of each block, including provisions for power, heat, ventilation, the disposal of refuse and the suppression of fire, vermin, and noxious exhalations?

These desiderata need in nowise encroach on the home sanctuary, and are well worthy the attention of American architects now called upon to restore whole cities from their ashes. G. H. K.

Cincinnati, Aug. 8, 1866.

Poisonous Bites--Mad Stones.

MESSRS. EDITORS:—You may inform your readers that a solution of sal-ammonia and water is one of the best, safest, and surest remedies for snake, spider, mad dog, or any other poisonous bite or sting, and, if applied soon, no trouble can ensue.

Do any of your readers comprehend the great value of the mad stone? I was bitten by a mad dog some twelve years ago, and went to a mad stone, and have had no trouble since. I have got a mad stone that will cure a bee sting while one can hold his breath.

The mad stone is got in that part of a deer called the rennet, and the size is in proportion to the age of the animal. I learned this fact while sojourning with the Indians on the Plains, and my object in giving it to the public is to save suffering, without cost. JOHN SMITH.

New Harmon, Ind.

A Big Snake Story.

MESSRS. EDITORS:—I have often heard of big snake stories, but the one I am about to relate is the largest one yet. On the 9th of this month, as a Mr. Prother and I were going to work we saw lying on the ground rail of the fence a large viper snake. I got a rail from the fence and pinned the snake to the ground, and Mr. Prother got another rail and killed it. In killing the old snake we found we had cut a hole in her from which young snakes were crawling out. I took out my pocket knife and commenced killing them. I killed all the young snakes to the number of eighty-one. The old snake was 37 inches long; the young ones were from seven to eight inches long. I am not sure that I got all of the young snakes; some of them may have crawled off unnoticed. Tell me if there was ever anything to equal this. The above can be substantiated by five persons. B.

Iowa City, Iowa, Aug. 11, 1866.

[We have nothing to match this story, and give it up.—EDS.

Encourage the Small Things.

MESSRS. MUNN & Co.:—The last patent granted me (improvement in shovel and tongs, patented July 10, 1866), secured through your able Agency, seemed to me, at first, to be but a small thing; so much so that I almost passed it by unnoticed, though it is, undoubtedly, a great improvement on the old shovel and tongs as they are separated, which it has proved for itself. I have devoted the last three weeks to selling county rights, and have sold eight counties myself, and put in my pocket nearly eight hundred dollars. I now know that it is a success, and feel that lasting gratitude is due you for encouragement in speaking of its merits, so that I proceeded to procure a patent for it. Hoping that you will continue to cherish the day of small things, I am

Very respectfully,

P. D. BRADLEY.

Preston, Md., Aug. 20, 1866.

Breaking of Watch Springs.

MESSRS. EDITORS:—Being a practical watchmaker, I have noticed that mainsprings of watches often break in a few days after they have been taken out of the barrel and carefully cleaned, without straightening them more than their natural elasticity does in being freed from the barrel. If you, or some of your intelligent correspondents, will tell the reason why, you will oblige a gratified reader of your paper. The breaking seldom occurs immediately—usually some days or weeks after the watch is cleaned and set running, and that, too, when the greatest care in recoiling the spring and putting back into the barrel has been observed. Is it due to the unequal wearing away of the enamel? J. CROSS.

Vineland, N. J.

How to Make Soldering Fluid.

MESSRS. EDITORS:—I have lately seen a very neat way of soldering holes in tin ware. A fluid is first applied around the hole, then a bit of solder put over and melted by holding a fluid lamp underneath. I have some curiosity to know what the fluid is, and how prepared. Will you please to answer in the SCIENTIFIC AMERICAN? W.

Worcester Co., Mass.

[The fluid was probably a solution of chloride of zinc. A convenient way of making it is to half fill a bottle with muriatic acid and add bits or scraps of zinc to neutralize the acid.—EDS.

MANUFACTURING IN GEORGIA.—The Louisville *Courier* says:—An intelligent gentleman, a resident of Georgia, furnishes us the information, which we must confess surprises us much, that there are at this time in process of erection in that State seventy-two mills for the manufacture of cotton and woolen goods, some of them for calicoes. This is an astonishing fact, but it is nevertheless the natural consequence of the events of the last five years.

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Improved Gun and Projectile.

This gun,—of the working parts of which we give a sectional view in the engraving,—has awakened considerable interest all over the country by its performances at the recent trial at the Government arsenal in Washington. We give a description of the parts. The dotted lines in Fig. 1 show the position of the screw and adjustable breech when the gun is to be loaded. Half a turn of the screw disengages it from the thread in the nut, and it can be easily drawn out and as easily replaced.

There is a slot or mortise through the breech of the gun, at right angles to the bore, and situated about one and a-half calibers from the rear end thereof. The mortise is a little wider than the diameter of the gas ring to be used, and slightly tapered on the rear side. Into this mortise the sliding breech block, A, fits, and through the narrow end of this block is a circular aperture, B, having a diameter equal to that of the loading chamber of the gun, through which, when the block is withdrawn, the charge is passed into the loading chamber. There is a shallow, circular chamber in the face of the breech block, A, to carry the adjustable bearing plate, C. The face, C, is recessed, as seen, to form a chamber to receive the gas deposit, and prevent it from cutting the bearing surfaces when the breech block is operated. The chamber, D, in the rear side of the breech block carries the operating screw, E, which fits into two or more inclined grooves or female threads in the plate, F, which fits into a recess in the rear side of the mortise, and is fastened by a screw, G. The screw, E, is operated by means of the handle, H. The bore of the gun is chambered at I, one to one and a-half inches diameter more than that of the barrel of the gun, and its depth about half an inch, and into this chamber is fitted a curved gas check.

The action of this gas check is similar to that of a ball joint, so that, however placed in its chamber, it will, when the block is shoved home, properly adjust itself upon its bearing, and prevent the least escape of gas. When the handle, H, is turned half round to the right, the breech block is forced out about half an inch by the screw, and may then be easily withdrawn to the position for loading the piece. When loaded, the block is shoved in as far as it will go, and the handle re-turned half round to the left; this forces the block into the exact position for firing, and locks it there. The gas check is permanently located, and self-acting, as well as self-adjusting, and needs to be withdrawn only when time and opportunity admits of cleaning the whole gun. The gas-proof principle of this invention lies exclusively in the action of the gas check upon the bearing in the face of the breech block. Duplicates of these two small pieces accompany each gun, and when one set become injured by long service, or from neglect, it can in three minutes be withdrawn and a new set substituted, which will render the gun as perfect and efficient as when first made.

Official trials with a steel 18-pounder Broadwell gun have just been made at the Washington arsenal. The report admits the entire success of the invention, the mechanism being simple and strong, and having been operated with ease and facility all the time; nor was there the least escape of gas at the breech to be discovered. The results of a competitive trial for accuracy between this gun and the regulation three-inch rifled gun are. at 800 yards, Broadwell gun, absolute deviation from point of impact, 25·4 inches, with solid shot of 18 lbs. and 1½ lbs. powder; regulation three-inch rifle, absolute deviation from point of impact, 34·7 inches, with solid shot of 10 lbs. and charge 1 lb. powder.

The Committee conclude by saying:—"Could this same principle be successfully applied to sea-coast guns, we think in many situations it would be very desirable."

Several 10-inch Broadwell guns are about to be ordered by the Government, for further trials on a large scale, preparatory to the adoption of the system in case it gives as much satisfaction in the large guns as it has already done in the smaller ones recently tried.

Fig. 1

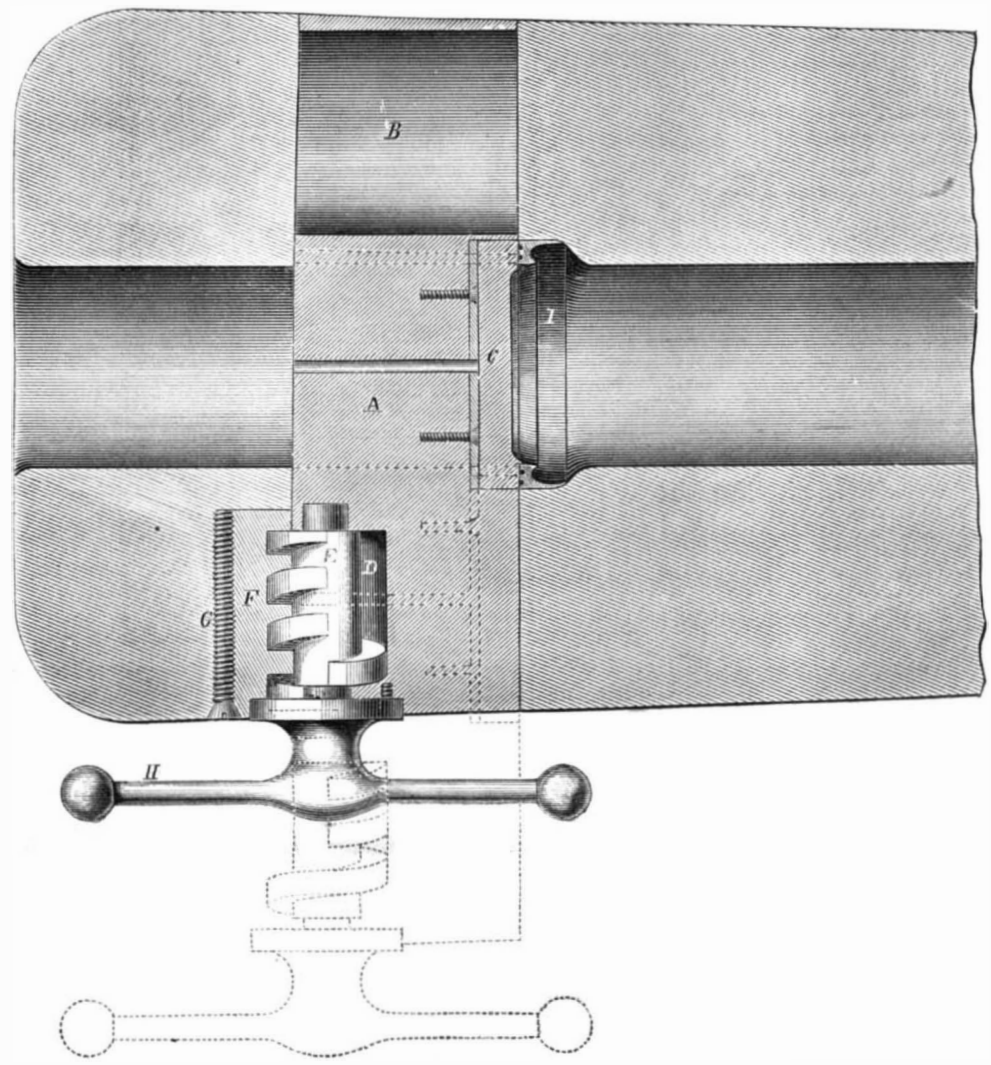
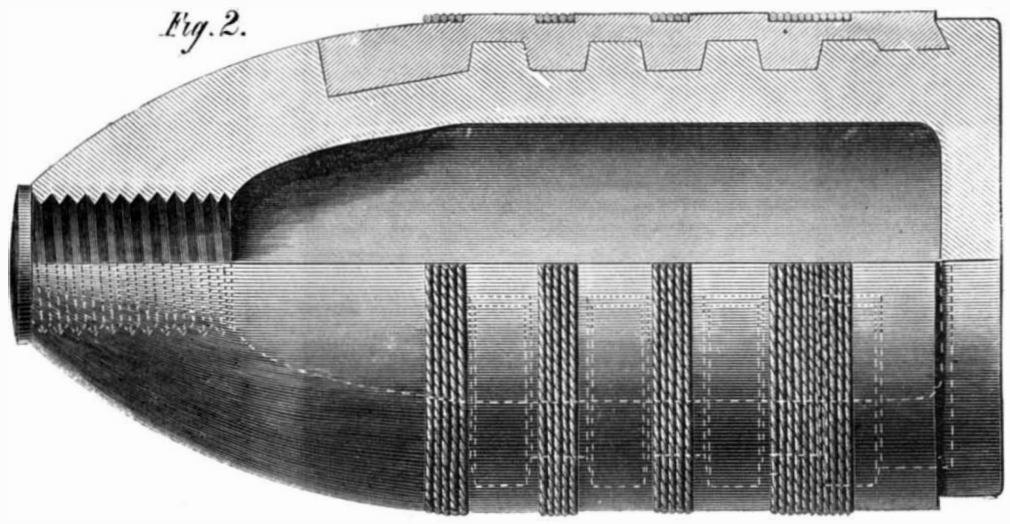


Fig. 2.



BROADWELL'S GUN AND PROJECTILE.

Broadwell's improved projectile (Fig. 2), is designed exclusively for breech-loading rifled ordnance. The invention consists simply in wrapping a cord of suitable size in the several annular recesses in the lead jacket, and rubbing over all pulverized graphite as a lubricator. The object of using the cord is to wipe the bore of the gun at each round, which it does more thoroughly than can possibly be done by hand, and thus dispenses with the labor and loss of time in sponging after each shot, as in the regulation.

A gun may be fired 1,000 rounds, or more, with this shot without cleaning, for the reason that there can never exist more fouling of the bore than is created by the one charge of powder which is burned behind each shot, the fouling of each charge being completely carried out by the succeeding shot.

The success of this peculiar method of packing projectiles is due to the fact that it is applied in short sections. When the cord is wrapped continuously, its displacement, after leaving the bore of the gun, impairs the accuracy of the shot. The packing, applied as here shown, in short sections, comes off simultaneously, and in the shape of tow, and for this reason does not derange the flight of the projectile.

This is an extremely simple invention, and cheaply applied, but is attended with important and valuable results. It was patented June 19, 1866, by L.W. Broadwell, who can be addressed for additional information at Washington, D. C.

ALTHOUGH the telegraph lines are now so widely extended, the employment of carrier pigeons is not altogether dispensed with. The Duke of Richmond objects to having Goodwood Park disfigured by posts and wires, and consequently, the Electric Telegraph Company employs pigeons to convey messages from Goodwood to the telegraph office at Chichester during the races. At the recent meeting thirty pigeons were employed, and the distance, six miles, was flown in about three minutes and a quarter

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CARBOLIC ACID THE MOST USEFUL DISINFECTANT.

Carbolic acid has lately come to be a great favorite as a disinfectant. Where its virtues are best known it is more relied on than anything else as a preventive of cholera. There are those who think that if it were liberally used wherever there is unhealthy organic decomposition, miasmatic diseases would soon become unknown. Our very efficient Board of Health, we observe, have added it to their list of disinfectants, and are using it on a large scale. At the next cholera season we predict that it will be better known and be more valued than any other disinfectant.

The reasons why carbolic acid is such an admirable disinfectant are easily to be understood. Miasmatic matter, and almost everything contained in the air which is offensive to the senses, are the products of the fermentation or putrefaction of organic matter. Now, it has been found that carbolic acid is the sovereign and never-failing anti-putrescent and antiseptic. The power of carbolic acid is wonderful for its promptness and its persistence. Putrefaction can neither go on nor be commenced in its presence; it preserves everything *in statu quo*. It is certain that several organic poisons act like a ferment, or are matter in the state of decomposition. Mr. Crookes has shown that the virus of the rinderpest is of this character, and it has long been surmised that the virus of serpents and of contagious diseases belong to the same category. In all these cases, wherever carbolic acid can be applied, it may prove to be a specific.

Chloride of lime acts very promptly as a deodorizer of the air, and to this fact it owes its high reputation. It destroys noxious matter by bringing about a chemical change in it. It enters into chemical union with some part of it, and no longer exists in a state to do more useful work; it is exhausted in doing its work; it is wholly used up. Moreover, chlorine acts by reason of its affinity for hydrogen; and as hydrogen is an element of innocuous matter, it wastes much of its energy where it is not needed. It deodorizes promptly, but where is the evidence that the virus has a foul odor? How do we know that anything beyond the odor is destroyed?

Carbolic acid, on the other hand, goes to the root of the matter. It acts as a preventive. It destroys our enemy in the egg. No noxious effluvia can come from the matter with which it is in contact. It mixes kindly with everything. A very remarkable fact about it is, that in doing its work, there is no chemical change. It remains always free carbolic acid, and the matter with which it is surrounded continues the same as at the first instant of contact. Thus the carbolic acid is never consumed, and may continue forever its office of restraining the demon.

Two simple experiments illustrate the peculiarities of chlorine and carbolic acid. Bring a piece of putrid meat into an atmosphere of chlorine and it comes out sweet. But wait. Observe that it is only the fetid atmosphere about the meat which was affected; let this be blown away, and a new one takes its place. Let the meat be now dipped in a weak solution of carbolic acid and exposed to a current of air. The foul odor is soon blown away, and the meat may continue sweet forever.

Carbolic acid is cheap, and is applicable under circumstances where anything else would be impracticable or objectionable. Thus it may be dissolved in the water used in sprinkling the streets, and relieve us from that peculiar city effluvium which is so noticeable and sickening to those who have just come out of the pure air of the country. It may be used in the washing of the clothing, bedding, etc., of infected persons. It is perfectly safe to be used in the family.

THE DUTY OF RECORDING EXPERIMENTS.

Most experiments in science and art are made with a view of substantiating some particular theory, or of elucidating some supposed fact, and if they fail to do this they are often looked upon as unsuccessful and valueless, and no record is made of what the investigator would consider his failure.

The idea is a wrong one. Every experiment is a success. If it did not result as was desired, it is no less a success than if it answered the most sanguine expectations of the projector. To prove that a thing cannot be done, or that a theory is false, may be as valuable as to achieve success, or establish a proposition. If not of direct advantage to him who made the test, it might be invaluable to others. Therefore, it is a duty the scientific man and practical mechanic owes to his kind, to keep a careful record of every manipulation, and trial with new combinations.

A few days ago an eminent mechanic, in speaking of some investigations he had made in regard to the expansive force of steam, said that he called on a firm who had followed the path of investigation for sixteen years, and ascertained that because the experiments had not determined the facts they sought to establish, they had preserved no record of them, or, if they made such records they had destroyed them. In this case an injustice had been done to other inquirers into the same subject.

The data, the processes, and the results of experiments, from their incipiency to their completion, ought to be carefully noted, and whatever may serve to throw light on the causes of failure, or serve as a means of furthering additional investigations, should be recorded and preserved.

In every thing which is of use to man, the grand, present result is the fruit of the work of generations. It can hardly be estimated how much further we might have advanced if the duty of recording means, object, and result had always been recognized. He who tries a new experiment adds directly to the world's wealth of useful knowledge. That the result did not answer his expectations argues nothing against this proposition. Many of our most valuable discoveries have come from these negative investigations. To prove that an object sought is opposed to the laws of nature and the qualities of matter, may be of as much benefit as to ascertain the converse.

Every experimentalist should bring to his investigations an honest desire to ascertain the truth, even if it proves him to be in the wrong. But many make tests simply to establish and demonstrate a favorite proposition, and, if not successful, carefully destroy all record of what they consider their failure. This is not wise from any point of view. The vocation of our practical men is higher than that of merely distinguishing or benefiting themselves. They work for the world at large, and if by a fortunate discovery or useful invention they make themselves rich, the world receives a larger share of the benefits than they. The inventor of the sewing machine, or those portions which make it a necessity, has been made immensely rich, but his fortune is but dust in the balance when compared with the benefit his inventions have conferred on the world.

It is a rule without an exception, that no man can absorb to himself the full benefit of an invention. He must share it with the mass, and when he selfishly attempts to hide his repeated failures by the light of his one grand success, he does violence to his own conscience and injustice to his fellow men.

TRANSVERSE FORCE OF EXPLOSIVE GASES IN GUNS.

In another column is an article from the *Engineering*, which mentions some facts in connection with experiments with a Whitworth gun, which seem to bear upon the subject of the wedging of confined explosive gases, a subject we have several times referred to before. The experiment was that of leaving an air space of twelve inches in one instance, thirteen in another, between the powder charge and the projectile of the Whitworth 70-pounder gun. The bore of the gun was enlarged at the base of the shot. It could be wished that the record of the experiment had stated whether there was a difference in the recoil of the gun, when fired with this air space intervening between the powder and projectile, and when fired without the intervention of the space. We believe it would be found that the force expended ordinarily in producing a rebound, or recoil, would be directed mainly against the walls of the gun. The test was a severe one for the gun, and it is highly favorable to the credit of the manufacturer.

If it could be proved that the Harding experiments demonstrated the fact, that the temporary compression and confinement of the atmospheric air, or the gas, at the instant of explosion, served the purpose of a breech sufficiently well to give a recoil toward the projectile, without much impairing its initial velocity, we should regard it as an immense stride in the science of gunnery.

Every experiment, or accident, having conditions similar to the trials of the Harding tubes, seems to substantiate the theory that the recoil of a gun can be taken up by a temporary breech of condensed gases. It is certain that guns are burst frequently when the missile is separated from the charge, or when there is an obstruction between the charge and muzzle, leaving an inclosed space. In such a case it seems plain that the action of the explosive is diverted from its course toward the muzzle, and exerts its tremendous power directly upon the walls of the tube.

It is well known that with a very heavy projectile, as in our large guns, quick-burning powder cannot be used. The mass of the projectile, we may imagine, moves sluggishly. It requires an almost inconceivable force to overcome instantly the inertia of the shot, and if the gases are generated too rapidly they jam, or wedge, before they can start the ball. Suppose these gases are allowed a space for expansion in a chamber bounded by the walls of the gun and the breech, which confine them closely, but at another point they find only the resistance of a column of air, backed by a heavy shot; the breech and immediate surrounding walls receive the first impact of the explosion, while in front of the charge, confined air resists the impulse. The explosive force is partially expended on this column of air, which is instantly compressed and forced against the walls of the tube. The particles of air are thus wedged before they can exert their proper force directly upon the projectile.

In the Whitworth experiments, the effect of this instantaneous wedging of the air particles was a permanent enlargement of the bore at the point of impact; that it did not burst the gun is excellent testimony in favor of the manufacturer.

We believe this subject is of importance enough to receive the earnest attention of our mechanics. A series of experiments directed to the elucidation of the action of explosives on a confined column of air, could not be otherwise than beneficial. It is a path that may lead to discoveries which may revolutionize the whole science of gunnery, as at present understood, and possibly give us some new ideas on the subject of boiler explosions.

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Do Animals Require Salt.

We find the following paragraph going the rounds of the press:—

"Is salt necessary for horses and cattle? A writer in the *Massachusetts Plowman* and the *California Rural Home Journal* says no. The fine Arab horses won't touch it."

A majority of animals—quadrupeds, at least—seem to have a natural taste for salt, and in a wild state they search eagerly for it. It is not, properly speaking, an acquired taste, for the craving for a saline substance does not grow with the animal, but appears to be as strong when approaching the form of maturity as it is in after years. In a wild state the animal seeks the marshy places, and what are called salt licks become their favorite haunts. If the taste is a natural one, it seems that it would be prudent to gratify it, to a certain extent, at least. We are well aware that many experienced breeders hesitate about feeding salt in the winter months, presenting the argument thus: Salt creates thirst, and cattle should not drink much water in cold weather, as it chills the blood, and requires a greater amount of food to triumph over it and preserve the necessary warmth of body. This, doubtless, is a correct view of the case, but we do not see why the same rule should be enforced in the summer months of our northern latitude. In the tropics salt should be sparingly fed the year round. Milk cows, especially, are benefited by plenty of salt, as water and succulent grasses add to the quantity of milk flowing into the pail morning and night. One of our most experienced breeders recommends rock salt, as the animals lick it and satisfy the natural craving without indulging to excess. In regard to the Arab horse not touching salt, a greater mistake was never committed. The writer has blundered seriously, and this error proves that he is ignorant of the subject of which he pretends to have an intimate knowledge. The Arab horse shows no more aversion to salt than do many other animals. Our race horses, of which he is the ancient progenitor, require salt when undergoing the ordeal of training, and they are benefited by it.—*Turf, Field, and Farm.*

A Kerosene Telegraph.

An apparatus termed a "kerosene telegraph," has been invented in Boston. It consists of two small boxes, arranged with levers for opening and closing apertures of an inch and a half in diameter. An ordinary keorsene lamp was placed in each box with a reflector behind it. One of these machines was taken by Mr. Cyrus A. George (also connected with the office) to a point in East Cambridge, a mile and a half distant from the city hall, and at eight and a half o'clock (the time previously agreed upon) his signals were received by his brother, who was stationed in the fire-alarm office in the cupola of the city hall. He answered them, and they continued to converse with great ease and rapidity for an hour, sending and receiving messages. They found no difficulty in reading as accurately and nearly as fast as by the ordinary means of telegraphing. With this apparatus the inventor believes he could operate easily five miles in clear weather, and by increasing the power of the light, ten or fifteen miles. An experiment will soon be made from the Boston office with some distant point in Roxbury or Dorchester.

Skating at the Sea Side.

The New York Skating Association, under the management of J. L. Plimpton, Esq., patentee of the celebrated parlor skate, illustrated in these columns some time ago, have secured the dining hall and other rooms at the Atlantic Hotel, Newport, R. I., where the sons and daughters of the sojourners at this fashonable resort daily assemble for instruction, and to practice the graceful and healthy art of skating.

Mr. Plimpton is master of the system of physical exercise which he teaches, and which himself and little daughters practice so skilfully, and therefore it is not surprising that wherever he goes he elicits the patronage and commendation of our most distinguished citizens. Mr. Plimpton's skate emporium and exercising Hall in New York is on the corner of Fourth avenue and Tenth street.

We are informed that a company has been organized at Greenboro, Pa., for the purpose of working some gold discoveries made in that vicinity.

Railroads and Telegraphs in South America.

While the United States and the European countries are continually executing some new plan for promoting the interests and welfare of the people, the nations of South America, though less favored with means, and not disposed to lag behind the spirit of the age, are extending, as far as possible, those great instruments of modern civilization—the railroad and telegraph. The Costa Rican Government has contracted for a chain of telegraphs extending from Punta Arenas, on the Pacific coast, to San Jose, and from thence to a convenient place on the Caribbean Sea. In Chili, internal improvements have been resumed since the departure of the Spanish fleet, and new railroads are being pushed to completion.

Improved Well-boring Machine.

A correspondent from Detroit describes an apparatus for boring wells, which he considers far preferable to the present clumsy mode. It is the invention of Mr. Charles L. Merrill, but from the description we judge it closely resembles one invented by a man named Atwood, which we saw at work in Titusville, Pa., in the spring of 1865. It consisted of a frame which contained a device for griping, turning, and raising the boring bar, and allowing it to drop again. The action of the drill could be determined and adjusted to any point, and no derrick, samson post, nor walking beam was required. For reasons unknown to us it did not supersede the old method, although it appeared to be efficient.

Polar Ice and the Gulf Stream.

M. Grad, in a letter read before the French Academy on the Polar Ice and the Gulf Stream, expressed the opinion that the stream keeps up its identity as far as the north of Siberia, and only loses itself in the Polar Basin. He contended that the pole is by no means always occupied with ice, and that as the waters of the Gulf Stream keep themselves open in the spaces of the glacial seas which they traverse, it is in the prolongation of that current between the Spitzbergen Group and Nova Zembla that we ought to look out for the easiest route by which to arrive at the Arctic geographical pole.

Place of the Piston when the Crank is Vertical.

In our issue of Aug. 11th, we replied, in an indifferent manner, to a question in regard to the position of the piston of a horizontal engine when the crank was vertical. A correspondent, A. S., gives the following rule:—"The hypotenuse of the right-angled triangle formed by the connecting rod and crank, deducted from the sum of the lengths of the two, gives the distance which the piston has receded from the end of the cylinder opposite the crank shaft. This deducted from half the length of the stroke, gives the distance of the piston from the center of the cylinder."

The *Memorial de la Loire* says:—"The change of the gun with which the infantry of the French army is provided has long since been resolved upon in principle; at present the manufacturers, and especially those of St. Etienne, are actively occupied in the fabrication of the new arms, which are smaller in the bore than the gun at present in use, and are loaded at the breech. It will be understood that this change must entail considerable expense. In order to lessen it as much as possible, the Emperor is reported to have authorized the Minister of War to dispose by degrees of the old flint muskets, percussion cavalry carbines, and smooth-bored cannon, as well as the sabers of abandoned patterns, which are in the magazines of the State."

A LABORER engaged at the proof butt in the Royal Arsenal, Woolwich, recently took a draft from a bottle containing what was supposed to be whisky. He was instantly seized with great pain, his body became suffused with a dark blue tinge, and he shortly died. His death was attributed to cholera; but upon the bottle being handed over to the chemical department of the Arsenal it was recognized as having contained about half an ounce of nitro-glycerin used in experimental shell firing. It had been negligently left at the butt after an experiment a few days previousiy.

Notes and Queries

Paul——, of Pa.—The simplest sort of an experiment would demonstrate that glass is a far better conductor of heat than wood, and consequently that wood is preferable to glass as a covering to prevent the radiation of heat.

C. H. L., of R. I.—A metallic mold is the best for casting britannia, but in your case you probably prefer a cheaper one. Make one of plaster of Paris and coat the inside with olive oil. The steam boiler you refer to is probably new and "foams" or "primes." Pump but little water in at a time and pump often, and fire carefully. It will remedy itself in time.

F. J. L., of Ill.—Polish the glass with fine sand and water, followed by pumice stone, rouge, or oxide of iron and putty powder.

R. F. L., of Miss.—Sawdust can be burned under any style of boiler. No peculiar construction of the bridge walls is required. It needs a strong draft, and the grate bars should be replaced by flat perforated plates of cast iron. A blower is necessary to force atmospheric air through the mass of sawdust. Its combustion is facilitated by roasting, or drying, in a retort, or oven, having a column of air passing through it. When thus prepared and fed under the boiler gradually, in small quantities, it makes a good fuel for generating steam.

W. J. V., of N. Y.—Loam for forming molds is made of common brick clay and sharp sand or coarse foundery sand. Sometimes brick powder is used with the clay. Cow hair saw dust, horse dung, or chopped straw is mixed with it, to give it porosity and tenacity. The mold must be thoroughly dried or baked before being used. We recommend as a treatise on this subject, the "Molder's and Founder's Pocket Guide," by Overman, published by Henry Carey Baird, 406 Walnut street, Philadelphia.

——, of Del.—An ice house can be constructed of wood, having double studding and walls. The spaces between should be filled with spent tan, sawdust, fine charcoal, or chopped straw, and the inside studdings celled with boards or planks, making an inner wall of inclosed air. The roof should be double, with considerable air space between the two, and the floor should be made so as to readily drain all the water from the ice. The ice itself should be protected with straw laid on thickly and secured with boards.

R. W., of Conn.—The temper of a knife used in paring apples is certainly not injured by the acid. We do not believe there is any acid which will injure the temper of steel when applied to its surface. The temper is a property of the mass, and the acid affects the surface only.—The wood which forms a part of the beaver's dam is so mixed up with mud and stones that it keeps its place. It is said that the beaver plasters the sticks of wood which form the base of the dam with mud expressly to prevent them rising. The skill of the beaver is often exaggerated.—You ask why it is that steel can be melted, while it may be injured by over-heating in a blacksmith s fire. We do not see that the melting and the injury by over-heating having any dependency upon each other, and we conclude that your question is unreasonable.

H. P. B., of Minn.—Dallett, in the "Miller, Millwright and Engineer," directs that mill picks should be heated to a cherry red, dipped in clean water, and the edge drawn only to a whitish color. This is a greater degree of hardness, we think, than most cast steel will stand, and we should prefer trying a pale straw. The edges of the pick should be dipped in yeast or beer grounds, before heating, to prevent cracking. 2. Soap rubbed on steel does not injure the steel.

C. E. W., of Ill.—It is difficult to assign a cause for the behavior of the boiler you speak of. Certainly, if you give us the right measurement, the plates of the boiler were thick enough. As the crown sheets gave way at the rivet line, we are not prepared to condemn the quality of iron used. Rather, we are inclined to attribute the failure of the boiler to a want of proper staying. Although not in possession of all the facts, we think there were no proper stay-bolts between the furnace sheets and the top of the boiler. Internal staying of a boiler, especially where the direct action of the heat tends to disintegrate the iron, is as necessary as external strength. Too little attention is paid to this feature in boiler making.

W. D., of C. W.—The whole power exerted on the propelling screw of a vessel is not utilized. 2. The proportion profitably productive of propulsion is variously estimated by different engineers, and is subject to varying circumstances. More power is exerted in still water, and when the vessel is at rest, than when she is moving rapidly through the water. For this reason, many engineers design propelling screws with an increased pitch, to make up for the slip occasioned by the backward movement of the water, but we do not fully believe in the efficiency of increased pitch screw-blades. 3. The non-feathering wheel looks well in theory, but in practice has not proved advantageous. 4. If the screw traversed an unyielding medium, the progress of the vessel would be exactly conformable with the pitch of the screw, multiplied by its revolution. 5. The feathering side wheel is not considered an economizer of power. The common side wheel is a feathering wheel when the vessel is in motion, and no device has yet been discovered which materially improves upon its performance.

A. L., of Vt.—There is no cement which will unite metal and wood so permanently as nails or screws. For temporary uses a great variety of compositions have been proposed. Where great adhesiveness and the water-proof quality are wanted, we have found melted raw rubber to answer pretty well. Rosin, wax, shellac, oil, etc., may be added to obtain the desired consistency.

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NEW INVENTIONS.

The following are some of the most prominent of the patents issued this week, with the names of the patentees :—

SAFETY PAPER FOR THE PREVENTION OF COUNTERFEITING.—JAMES M. WILCOX, Glen Mills, Pa.—This invention consists in introducing into bank-note, or other paper, at the period of its transformation from pulp to paper, of colored fibers, and interweaving them in such a manner, with the ordinary fibers, as to group them in lines or figures, or in any other peculiar manner. This differs from former devices for the same purpose, which consist in placing threads or colored pulp between two thin sheets; and it has this peculiarity, in which its great protectional quality consists: it cannot be imitated by introducing the colored fibers between cemented sheets, but the plan must be carried out upon a Fourdrinier machine, and during the process of manufacture. It differs, also, from the old French method, which consists in introducing pigments in lines, etc., into the body of the sheet during its consolidation from pulp, for the pigments can be imitated by external coloring upon paper, whereas colored fibers cannot. We have seen samples of this new paper whose imbedded fibers, by holding the paper before the light, are readily distinguished from mere surface imitation, and we recommend its use as affording one more important safeguard against counterfeiting. Inasmuch as this paper can only be made in a regular paper mill, and only in those comparatively few, mills which possess the Fourdrinier machine, it could not be made without a certain notoriety, involving almost certain detection, if the manufacture should be attempted for unlawful purposes.

FASTENING FOR TRUNKS, BAGS AND VALISES.—W. S. PADDOCK, Albany, N. Y.—This device is the subject of a patent, bearing date, August 21st, 1866. The fastening consists of a fixed and a movable plate, the former having a series of headed pins, and the latter a corresponding number of pear-shaped apertures; the movable plate or slide being adjusted by a knob, so as to place the headed pins in the smaller part of the aperture, and thus fasten the two plates together, or by a further movement of the slide the pins are made to stand in the larger part of the apertures and thus permit the plates to be separated and the bag to be opened. When the plates are fastened together, as above stated they may be locked by forcing the bolt of a common block against a small stop on the slide. These plates, extending the entire width of the trunk, bag, or valise, afford a continuous fastening instead of confining the mouth at one point only; can be cheaply manufactured and applied. Manufacturers and others may obtain any desired information by addressing Mr. Paddock as above.

BOOT AND SHOE EDGE PARER.—WILLIAM FREDERICK, Ashland, Pa.—This invention consists of an instrument formed by combining a holder, cutter, and block or guard with each other, for paring or shaving the edges of boots and shoes without cutting or injuring the uppers.

BURGLAR ALARM AND DOOR FASTENER COMBINED.—F. OAKLEY, London, Eng., assignor to JOHN COLLINS, New York City.—This invention relates to an instrument which will, when applied to a door or window, not only effectually prevent the opening of such door or window, but will also sound an alarm, when an attempt is made to open it.

MACHINE FOR SAWING STONE.—SIMEON SHERMAN, Weston, Mo.—This invention relates to a new and improved machine for sawing stone or rock into blocks with parallel sides and plane surfaces, or with curved sides, the mechanism being arranged in such a manner that the sides of the block may be sawed to any desired angle, and the block of stone adjusted in proper relative position with the saws, without moving it on its bed.

DRILLING ATTACHMENT FOR TURNING LATHES.—JAMES MCCRUM, Locust Grove, Ohio.—This invention relates to a new and useful attachment for turning lathes, whereby articles may be drilled with greater facility than hitherto.

HANDLES FOR CUTLERY.—TAYLOR D. LAKIN, Hancock, N. H.—The object of this invention is to obtain a neat and ornamental handle for cutlery, more especially table cutlery, and one which may be securely fastened on the tang of the blade, and constructed at a very moderate cost.

CORN CULTIVATOR.—H. S. POTTER, Fairfield, Iowa.—This invention consists in a novel construction and arrangement of the framing, plow beams, hounds, driver's seat, etc., whereby the operation of the plows is not affected by the draught, and the inner plows rendered capable of being adjusted or moved with the greatest facility.

DEVICE FOR STARTING CARS.—HENRY H. COVERT, Detroit, Mich.—This invention consists in applying a pinch bar or lever (one or more) to a railroad car, in such a manner that when the propelling power is applied to the car, the pinch bars or levers will be first actuated by such power, and made to operate directly upon the wheels, so that the car will be started with the greatest ease.

HAY-LOADING WAGON.—ANGELOS M. CLARA, Whitney's Point, N. Y.—This invention relates to a new and improved hay-loading attachment for wagons, the device being also applicable for raising and stowing hay in barns.

TIRE SHRINKER.—H. W. CASWELL, Yarmouth, Me.—This invention relates to a new and simple device for shrinking tires for wheels, so as to avoid the cutting and remolding of the same.

PUMP FOR DEEP WELLS.—W. HOAGLAND, New Brunswick, N. J.—This invention has for its object the improvement of pumps for oil and other deep wells, and it consists in the construction of the piston, the piston rod, and its valve.

CULTIVATOR.—CHARLES DANIEL, Lamonte, Mo.—This invention is for an improved corn cultivator, drawn by a double team, having fixed plows running centrally between the rows, and vibrating plows on each side, under the control of the driver, the frame of the cultivator being elevated to straddle the plants.

WORK HOLDER AND SCISSORS SHARPENER.—C. E. STAPLES, Worcester, Mass.—This invention relates to an extremely novel and useful combined holder for cloth, when being sewed, and a device for the sharpening of scissors.

CALIPERS.—PHILO SOPER, Buffalo, N. Y.—This invention consists in a novel construction of self-registering calipers, whereby any deviation from the measure for which the instrument is set, is indicated by a supplementary index.

APPARATUS FOR CARBURETING AIR.—PATRICK MIHAN, Boston, Mass.—The object of this invention is to carburet air, so as to produce an inflammable gas, and consists in certain novel devices whereby the desired result is obtained in an expeditious and economical manner.

BLACKING COMPOUND.—W. F. QUIMBY, Wilmington, Del.—This invention relates to a compound for a blacking for the polishing of boots and shoes, etc.

CIRCULAR SAW.—J. E. EMERSON, Trenton, N. J.—This invention relates to an improvement in circular saws, of that class which are provided with removable or detachable teeth. The object of the invention is to facilitate the adjustment of the teeth in the saw, and at the same time retain all the advantages of previous patented inventions of this kind while avoiding an objection pertaining thereto, which is the weakening of the teeth by the insertion of rivets at the most vulnerable points.

GRAIN-DISCHARGING DEVICE FOR HARVESTER.—ROBERT MORRIS, Salem, Ind.—This invention relates to a new and improved device for discharging grain in gavels from harvesters, and consists of endless carriers in connection with a rotary gavel discharger, provided with a regulating attachment for determining the size of the gavels.

LOCK.—E. R. HOPKINS, New York City.—This invention relates to that class of locks which are susceptible of having the operating parts for throwing the bolt so set and adjusted with regard to each other that to unlock the lock it is necessary to perform a combination of movements corresponding to that performed in the setting of the locking devices.

BAND SAW.—PAUL PRYIBIL, New York City.—This invention consists in the arrangement of an adjustable guide, composed of two jaws connected to a central screw, and provided with a series of shoulders of different width, in such a manner that the guide can be readily adapted to saws of different width, simply by turning it round on its central screw. It consists further in the arrangement of a yielding or elastic support under the adjustable journal box of one of the drums which carry the saw, in such a manner that if the saw strikes a knot or hard spot, the journal box yields sufficiently to prevent the saw from snapping.

OPERATING INDIA-RUBBER SPRINGS.—J. W. WILDER, New York City.—This invention consists in the arrangement of a protecting case and plunger, in combination with a long and comparatively thin piece of india-rubber, in such a manner that when said piece is exposed to a pressure tending to compress its ends, the protecting case prevents the same from doubling up, and retains it in position to sustain the pressure acting on it; and, furthermore, by the protecting case the india-rubber is permitted to expand throughout its whole length, and a spring of great power and activity is obtained at a comparatively trifling expense.

MACHINE FOR STACKING HAY.—WILLIAM LOUDEN, Fairfield, Iowa.—This invention relates to a new and improved machine for stacking hay, and consists in a novel manner of arranging and bracing a crane, and also a novel arrangement of the sweep mechanism, by which the power of the horse is applied to the tackle which elevates the fork, all arranged in such a manner that the device may be readily put up and taken down, and the loaded fork automatically brought over the stack and released, so that it may descend without backing the horse.

BOBBIN FOR SEWING MACHINE.—CORNELIA F. INGRAHAM, Indianapolis, Ind.—This invention consists in constructing a bobbin for use on the Wheeler & Wilson sewing machine, in such a way as that it may be separated into two parts, whereby the operator is enabled to pick out a broken thread, to untangle the thread on the bobbin, or to ascertain the amount, the "number," or the color of the bobbin thread without trouble.

COMPOSITION FOR ARTIFICIAL RUBBER.—WILLIAM T. BOND, Philadelphia, Pa.—This invention relates to a composition which possesses all the properties of vulcanized rubber, and is adapted to all the purposes for which that article is used, such as the manufacture of combs, buttons, etc.

WHIFFLETREE.—D. A. GORHAM, Lawrence, Mass.—This invention consists of the revolving trace hooks and connecting bar or rod, in combination with the whiffletree, and in connecting the whiffletree to the fore part of the carriage, in such a way that the horse can be released from the carriage in an instant whenever necessary.

FENCE.—CONRAD SEABAUGH, San Antonio, Texas.—This invention consists in the peculiar manner of securing the rails to the posts with wires.

WAGON BRAKE.—GEORGE W. CROWE, Cincinnati, Ohio.—This invention is an improved wagon brake, formed by combining the lever brake bars, the connecting lever, the connecting bar, and the operating lever with each other, in such a way that the power applied to the operating lever may act with double force upon the brakes.

CULTIVATOR.—MICHAEL PORTER, C. E. JENKINS, and G. F. JENKINS, Terre Haute, Ind.—This invention relates to an improvement in that class of cultivators which straddle a row, and which are provided with a raised draught pole that passes over the growing plants.

HORSE HAY RAKE.—D. M. DUNHAM, JEREMIAH WEBB, and ALBION WEBB, Bangor, Me.—This invention is a hay rake from which the hay may be readily discharged, and the teeth of which may be readily held away from the ground while the rake is being transported from place to place.

STOVE-PIPE DRUM.—FRANCIS E. RUTH and JOSEPH DE LONG, Upper Sandusky, Ohio.—This invention consists principally in the combination of an interior tapering or thimble-shaped tube, with the exterior drum and interior central pipe, for the purpose of forcing the heat against the outer cylinder; and in the combination of a dish-shaped damper, with the outer cylinder, the tapering tube, and the interior pipe.

WATCH PROTECTOR.—T. W. TERRY, Baltimore, Md.—This invention consists in the arrangement of a plate, provided with a hinged yoke or staple, and constructed so that it can be conveniently secured in a watch pocket, in such a manner that when the guard of the watch is placed between the plate and staple, and the chain fastened to the button hole, as usual, the watch cannot be with drawn.

PRINTING YARN.—EDWARD J. STEPHENS and HIRAM E. GREEN, Pawtucket, R. I.—This invention consists in printing yarn by means of one fluted and one plain roller, the fluted roller being supplied with the requisite quantity of color from a suitable box or trough. The yarn, in passing through between the two rollers, is printed simultaneously on both sides.

CUTTING BOARD.—ROLAND C. HUSEY, Milford, Mass.—The object of this invention is to produce a good and durable cutting board for laying out and cutting leather in the manufacture of boots and shoes.

SHUTTLE CARRIER FOR SEWING MACHINES.—JOHN SHELLABERGER, Hampshire, Ill.—The object of this invention is to simplify and improve the shuttle carrier of sewing machines, which is now an expensive part of the machine, and not distinguished for simplicity either in construction or in the matter of adjustment.

EVAPORATOR.—JAMES LITTLE and S. W. LITTLE, Patoka, Ind.—This invention relates to an evaporator for saccharine juices and other liquids. It is placed on an arch of gradually diminishing size, supported at one end by an adjustable rod, by which the inclination of the pans can be regulated to suit circumstances. The several compartments of the evaporator are provided with inclined skimming shelves, whereby the scum is readily removed from the liquid, and the operation of boiling saccharine and other liquids is materially facilitated.

HORSE RAKE.—CHARLES KUGLER, Cadiz, Ohio.—This invention relates to a new and useful improvement in that class of horse rakes which are provided with wire teeth fitted in a head, which turns in suitable bearings. The invention consists in applying a treadle to the head in such a manner as to counterpoise the teeth, and render the rake capable of being raised with the greatest facility, in order that it may discharge its load, and still be capable of being held firmly down to its work when required.

TREATING SUGAR CANE.—J. C. BELL, Pawnee City, Nebraska.—This invention relates to a new and improved process for treating sugar cane, particularly sorghum, previous to exposing it to the action of the grinding rollers, in such a manner that the vegetable and acrid matters contained in the cane are prevented from getting mixed with the juice, and a sirup obtained of superior quality, not liable to sour.

BANJO.—GEORGE MEIN, Williamsburgh, N. Y.—This invention consists in the combination of an interior rim with the exterior rim and with the head, and in the peculiar manner of attaching the stem to the rim.

HATS, BONNETS, ETC.—WILLIAM S. NELSON, St. Louis, Mo.—This invention relates to an improvement in the construction of hats, bonnets, etc., whereby a constant current of air is allowed to pass freely around the head, keeping it at all times comfortable.

NEW PUBLICATIONS.

NEW PHYSIOGNOMY, OR SIGNS OF CHARACTER. By Samuel R. Wells. New York: Fowler & Wells, No. 389 Broadway.

The comprehensive character of this work will be understood when we state that it contains nearly eight hundred pages and one thousand illustrations. Every shade and shape of nose, eyes, mouth, lips, teeth, cheek, chin, neck, ears, hair and eyebrow, hands and feet, are here represented, with explanations of their languages, value, and significance in the great art of reading character. Given the carte de visite of the individual and the color of the hair, and with this "key to life" in hand, the character may, we suppose, be easily read. The book is full of ingenious comparisons. The structure of the human body is also explained; so are the various temperaments, the outlines of phrenology, the effects of climate on character, the signs of health and disease, the great secret of human beauty, etc. Altogether, this book is a very singular compound of interesting things, and abounds with suggestive topics for ordinary conversation, which render it valuable.

SPECIAL NOTICES.

John Pepper, of Lake Village, N. H., having petitioned for the extension of a patent granted on the 5th day of Dec., 1854, patented in England the 22d day of Nov., 1852, and reissued to said Pepper Dec. 27, 1863, for an improvement in knitting machines, the said petition will be heard on Monday, the fifth day of November next.

Daniel Tainter, of Worcester, Mass., having petitioned for the extension of a patent granted to him on the 30th day of November, 1852, for an improvement in rotary knitting machines, it is ordered that the said petition be heard on Monday the 12th day of November, 1866.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and inclosing $1 as a fee for copying. We can also furnish a sketch of any patented machine to accompany the claim, at a reasonable additional cost. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

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ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING AUG. 28, 1866.

Reported Officially for the Scientific American.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & Co., Publishers of the SCIENTIFIC AMERICAN, New York.

57,454.—METHOD OF PREVENTING THE COATING OF PIPES USED IN MASH TUBS.—Albert Adams, Springfield, Mass.

I claim the process herein described of passing cold fluid through the pipes ordinarily used for heating a semi-fluid substance, when the same is used, substantially in the manner and for the purpose herein set forth.

57,455.—MACHINE FOR IRONING HOSIERY.—Walter Aiken, Franklin, N. H.

I claim the hosiery-ironing machine, made as described, viz: of the two hollow drums or cylinders, the flexible connection pipe, the driving shaft and gears, the stationary and movable boxes, tubular journals and stuffing boxes, arranged with and applied to a frame, A, substantially as and for the purpose and to operate as specified.

57,456.—SNAP HOOK.—Charles H. Alsop, Middletown, Ct.

I claim the hooks, B B, secured together at one end, one upon the other, and swiveled at each end to the eye-frame, E, substantially as and for the purpose described.

57,457.—HORSE COLLAR.—Clark Alvord, Westford, Wis.

I claim the mode of fastening the tops of horse collars by an elastic coupling, and for the purposes mentioned, as above described and shown.

57,458.—MANUFACTURE OF BICARBONATE OF SODA, POTASH, AND HYDROCHLORIC ACID.—Haydn M. Baker, Rochester, N. Y.

I claim the application of the principle of double decomposition of chloride of sodium or potassium, and nitrate of lead, for the formation and manufacture of nitrate of soda or potash, and the subsequent application to the manufacture of the decomposition of the said nitrate of soda or potash with silicic acid, for the purpose of forming soluble silicate of soda or potash, together with the utilization of the nitric acid, liberated by said decomposition, in the formation of nitrate of lead with the recovered oxide of lead.

I also claim the application of the processes herein described and set forth, for the recovery of the oxide of lead from the chloride of lead with oxide of magnesium, and subsequent recovery of magnesia by distillation, from chloride of magnesium.

I furthermore claim the application of carbonic acid under any degree of pressure, for the decomposition of silicate of soda or potash, in the manner herein described, for the purpose of forming carbonate, or bicarbonate of potash or soda.

57,459.—EVAPORATOR.—A. Belding, Madison, Ind.

I claim the pan, arranged as described, with the hinged skimmer, C, scum pan, G, cooling opening, J, substantially as described and represented.

57,460.—LAMP-CHIMNEY CLEANER.—William B. Bernard, Waterbury, Ct.

I claim as a new article of manufacture a lamp-chimney cleaner having one or more arms, B B', hinged to a handle, A, and so combined with a spring, D, as herein described, so placed above the hinge or hinges as to force said arms outwardly, all substantially in the manner and for the purpose herein set forth.

I claim, also, corrugating the pads, E E, of a lamp-chimney cleaner, substantially in the manner and for the purpose herein set forth.

57,461.—BRICK.—David L. Bartlett and George H. Johnson, Baltimore, Md.

We claim a brick having bosses projecting from one face thereof and counterpart recesses formed in its opposite face, each at a point midway between the sides, center, and end of the brick, substantially in the manner and for the purpose herein set forth.

57,462.—CONSTRUCTION OF DOUBLE-CYLINDRICAL STRUCTURES.—D. L. Bartlett and George H. Johnson, Baltimore, Md.

We claim granaries, reservoirs, towers, etc., constructed of bricks formed substantially as herein described, and laid in double concentric walls, in combination with metallic tie-plates, substantially in the manner herein set forth.

57,463.—MOLD BOARD FOR PLOW.—GeorgeA. Beard, Cavetown, Md.

I claim the elevation and enlarged extension of the mold board of the plow, as described above, and nothing else or more.

57,464.—POST-OFFICE DELIVERY BOX.—Jacob H. Beidler, Lincoln, Ill.

I claim the combination of the lever lock bolt, C, with its hooked end, h, the corrugated plate, D, with the notch, b, and the sliding plate, E, with its projecting flange, f, and staple, d, all constructed, arranged, and operating substantially as and for the purpose described.

Second, I claim the lever lock bolt, C, in combination with the corrugated plate, D, or its equivalent, when so arranged that said lock bolt may be operated to unlock the door from the outside by means of a key, and from the inside by a movement of the lever, substantially as shown and described.

Third, The combination of the sliding plate, E, with its staple, d, the lever lock bolt, C, and the bell, F, so arranged that the turning of the key to unlock the door will cause the lever, C, to strike and ring the bell, substantially as described.

Fourth, The inclined plane, j', of the corrugated plate, D, in combination with the lever lock bolt, C, so arranged that when the front end of said lock bolt is depressed by turning the key, it will strike the said inclined plane, j', and start the door open, substantially as described.

57,465.—METHOD OF TREATING SUGAR CANE.—J. C. Bell, Pawnee City, Nebraska.

I claim the within described process of treating sugar cane previous to grinding, by exposing the same to the action of boiling water, or steam, or both combined, substantially as and for the purpose described.

57,466.—RATCHET DRILL.—George W. Bishop, Stamford, Ct.

I claim the screw, G, fitted in an internal screw thread in the arbor, A, in connection with the friction device composed of the slotted tube, J, and band, K, or their equivalents, for connecting the screw with the head, I, substantially as and for the purpose pecified.

57,467.—RAILROAD RAIL.—J. L. Booth, Rochester, N. Y.

I claim a rail for railroads composed of the iron body, A, and steel cap, B, when the latter is rolled and shrunk on the body, in such a manner as to unite the parts closely, as a unit or whole, but still allow them to be easily separated and replaced, substantially as herein set forth.

57,468.—ARTIFICIAL RUBBER.—William F. Bond, Philadelphia, Pa.

I claim a compound made of shellac, glue, and borax, substantially as and for the purpose described.

Also, a compound made of glue, shellac, borax, and flour, substantially as and for the purpose set forth.

Also, a compound made of glue, shellac, borax, flour, and linseed oil, substantially as and for the purpose described.

Also, a compound made of glue, shellac, borax, and molasses, substantially as and for the purpose set forth.

Also, a compound made of glue, shellac, borax, molasses, flour, and linseed oil, substantially as and for the purpose described.

Also, a compound made of glue, shellac, borax, molasses, flour, linseed oil, and emery, substantially as and for the purpose set forth.

57,469.—APPARATUS FOR DRYING PEAT.—Hezekiah Bradford, New York City.

First, I claim a series of cars, moved gradually through a heated chamber, and provided with ranges of platforms, holding the peat to be dried, and then cooled, or partially cooled, by the action of the air, substantially as set forth.

Second, I claim the cars for drying peat formed of a series of sectional platforms, in the manner specified, to facilitate the reception and discharge of peat, substantially as set forth.

57,470.—CAR VENTILATOR.—J. A. Caldwell, Springfield, Mass.

I claim the arrangement of the wings, D D, on the outside of the case, C, in combination with the rod, b, packing, g, spring, d, and catch, c, substantially as described.

57,471.—MACHINE FOR GRINDING AND POLISHING BUTTONS.—G. J. Capewell, West Cheshire, Ct.

First, I claim grinding and polishing buttons by means of a machine, having suitable holders for the buttons, and so arranged and operated as to subject the buttons to the action of the grinding and polishing surfaces, substantially in the manner described.

Second, Imparting a rotary movement to the button holders while subjected to the action of the grinding and polishing surfaces, as and for the purpose specified.

Third, So constructing and arranging the button holders with regard to the machine, that, as the machine is operated, the buttons shall be automatically delivered therefrom after having been both ground and polished, or either ground or polished, substantially as described.

Fourth, So constructing and arranging the button holders, with regard to the machine, that, as the machine is operated and the button holders in turn pass to the grinding or polishing surfaces, as the case may be, they shall be automatically so operated upon as to sufficiently lift to clear the edges thereof, and thus prevent their impingement against the same, and then lowered thereto, or brought to bear thereon, with sufficient pressure to produce the desired grinding and polishing of their surfaces, substantially as described.

Fifth, The combination with a common head plate, having a series of one or more holders suitable for the reception of the buttons to be ground and polished, and to which head plates a rotary or other proper movement is imparted, of the grinding and polishing wheels or surfaces, arranged and operating with regard to the said head plate and each other, substantially in the manner described and for the purpose specified.

Sixth, Holding the buttons, in their holders, upon their sides or edges, by means of a spring, or other device, suitably arranged therefor, and substantially as and for the purpose specified.

Seventh, The peculiar construction of the button holders herein described, the same consisting of the hollow shaft, l, with its collar, o, in which the buttons are placed and held, surrounding casing, s, having a coiled or other suitable spring upon its inside, cap or head, t, and center spindle, u, passing entirely through the hollow tube, l, with a spring, w, the whole being arranged together as described and operating as the head plate is revolved, and the upper ends of the button holders pass over and under the fixed arms, f4 and g4, substantially in the manner and for the purpose specified.

Eighth, The combination of the head plate, having arranged upon it a toothed disk, Q, and stationary plate, T, secured to the said toothed disk, Q, by means of a set screw, V2, or other suitable device, with the pinion wheels, S, of the button holders, arranged and operating together substantially in the manner and for the purposes described.

57,472.—MELODEON.—Peter Carbach, Cleveland, Ohio.

First, I claim the bellows, G, valve, a, exhaust pipes, l l', and valve opening, b b' b", in combination with the valve, c, jointed arm, I, link, J, and lever, J, and pedal, B, as and for the purpose set forth.

Second, I claim the bellows, G, arm, M, and link, f, in combination with the two-armed lever, N', valve, N, and spring, g, as and for the purpose set forth.

Third, I claim the valve, a, spring, a', bellows, G, in combination with the induction pipe, b", reserve bellows, F, exhaust bellows, C C', as and for the purpose set forth.

57,473.—FRUIT GATHERER.—J. T. Carpenter, Thompsontown, Pa.

First, I claim the shank, C, provided with prongs, D D, which said prongs are covered with india-rubber, or its equivalent, and constructed substantially as herein represented.

Second, The cords, F F, arranged with the prongs and the ring or loop, E, for the purpose of conducting the fruit to the conductor, G, substantially in the manner herein set forth.

57,474.—MACHINE FOR GROOVING LUMBER.—Merrill E. Carter, Syracuse, N. Y.

I claim the combination of the angular cutters, D D, and the horizontal cutter, G, operating substantially in the manner and for the purpose herein set forth.

57,475.—DEVICE FOR SHRINKING TIRE.—H. W. Caswell, Yarmouth, Me.

I claim the two parallel bars, A A, connected by the screw rods, B B, and provided with the clamps, C C, all constructed and arranged to operate in the manner substantially as and for the purposes herein set forth.

57,476.—GRAPPLING IRONS.—John H. Chapman, Utica, N. Y.

First, I claim the grappling irons with the hooked ends and extension points, or their equivalent, substantially as described for the use and purpose mentioned.

Second, The elevating implement with or without the detaching part, constructed and operating substantially as described for the uses and purposes mentioned.

Third, The grappling irons and the elevating implement with or without the detaching part in combination, substantially as described and for the uses and purposes mentioned.

57,477.—FEEDING TROUGH.—Robert Chesnut, Richmond, Ind.

I claim a feeding trough divided into a series of compartments communicating with one another, and so arranged as to receive the feed simultaneously from a tank located above the trough, the supply being regulated by a valve, G, actuated by a lever, H, the several parts being respectively constructed and arranged for use, substantially as set forth.

57,478.—HAY-LOADING WAGON.—Angelos M. Clara, Whitney's Point, N. Y.

I claim the shaft, G, provided with the pulley, F, with the ropes, L D, attached respectively thereto, in combination with the slide bar, M, applied to the draught pole, N, the upright pole, B, with arm, C, projecting from it, and the levers, H, in which the shaft, G, is fitted, and having the brake or shoe bar, J, attached, all arranged and applied to a wagon to operate substantially as and for the purpose specified.

57,479.—TANK FOR PETROLEUM.—Marius C. C. Church, Parkersburgh, W. Va.

I claim the combination of the tank, A, of the chamber, D, provided with the safety valve, C, and connected by orifices as described and for the purpose of the storage and transportation of petroleum or other liquid.

Second, The tank, A, segment shaped in transverse section, the flat upper surface forming the floor of a secondary chamber.

57,480.—ANIMAL TRAP.—Daniel Cole, Ornell, Pa.

I claim the treadle, c, arranged within the box, A, with the rod, d, springs, s and m, door, e, windlass, y, and cords, z z, by which means the animal is lowered into the under chamber of box, A, closing the door through which it entered and imprisoning itself after passing through the gates, g, into the supplementary chambers, when arranged in the manner herein specified.

57,481.—HEAT RADIATOR.—Jessie Conger and John Borthwick, Philadelphia, Pa.

First, I claim the heat radiator composed of metallic disks permanently attached together and combined with the body or fireplace of any stove or any device or devices, substantially the same, for the purpose and in manner above described.

Second, The combination of our heat radiator with cylinder P', for the purpose and in the manner aforesaid described.

57,482.—HORSE RAKE.—A. J. Curtis, D. J. Roberts and W. Curtis, Swanville, Monroe, Me.

We claim the arrangement and combination of the gears on the wheels with the rack bars and their operative mechanism as described, applied to the rake head and the axle, the whole being substantially as specified.

57,483.—FANNING MILL.—H. W. Curtis, Lockport, Ill.

I claim the combination of the bar, J, shafts, I, pins, m n, and suspenders, L, with the shoe, v v, shaft, H, and slot, K, substantially as described.

57,484.—CULTIVATOR.—Charles Daniel, Lamonte, Mo.

First, I claim the jointed handled and vibrating cultivator, h h in combination with the plow beams, c c, the axle, B, and hounds, a a, constructed and operated substantially as and for the purposes herein described.

Second, I claim the suspended plow beams, c c, in combination with the hounds, a a, and the stirrups, d d, constructed and operated substantially as and for the purposes set forth.

Third, I claim the arrangement of the oblique hanging hounds, a a, in connection with the center beam, A, the plow beams, c c, the side braces, e e, and the axle, B, constructed and applied substantially as and for the purposes herein specified.

Fourth, I claim the arrangement of the swinging seat, c, on the center beam, A, in combination with the vibrating cultivators, h h, and their jointed handles, m m, applied in connection therewith, substantially as and for the purposes herein described.

57,485.—CLOTHES WRINGER.—J. C. Dicky, Saratoga Springs, N. Y.

I claim two cores with alternate depressions and elevations meshing with each other through their entire length, in combination with the rubber covering that conforms both externally and internally to the inequalities of the core.

57,486.—PRINTING PRESS.—Andrew Dougherty Brooklyn, N. Y.

I claim the combination in a printing press of the following instrumentalities, viz: the printing cylinder, reciprocating carriage for flat printing surfaces, inking apparatus therefor, impression cylinder for curved printing surfaces, inking apparatus therefor, and carriage for the inking apparatus, all operating in the combination substantially as set forth.

I also claim the combination in a printing press of the following instrumentalities, viz: the printing cylinder, reciprocating carriage for flat printing surfaces, two impression cylinders for curved printing surfaces arranged at opposite sides of the main printing cylinder, two inking apparatuses therefor, and two carriages for the inking apparatuses, all operating in the combination substantially as set forth.

57,487.—HAND TRUCK.—Samuel R. Dummer, New York City. Antedated Aug. 17, 1866.

First, I claim the combination of the elastic studs, b, and wheels, D, constructed and arranged in the manner and for the purpose herein specified.

Second, The combination of the flexible washers, n, and hubs, g, arranged in the manner and for the purpose herein specified.

57,488.—HORSE RAKE.—D. M. Dunham, Jeremiah Webb, and Albion Webb, Bangor, Me.

First, I claim the combination of the ratchet wheel, H, pawl, N, or equivalent, and sleeve, J, with each other, and with the wheel, F, to which they are attached and by which they are operated, and with the shaft, C, which they operate, substantially as described and for the purpose set forth.

Second, The combination of the springs, P and O, and bent rod, R, with the pawl, N, for the purpose of causing the pawl to engage with the ratchet wheel, substantially as described.

Third, The combination of the stop, S, with the pawl, N, for the purpose of disengaging the pawl from the ratchet wheel, substantially as described.

Fourth, The combination of the bent lever, U, with the frame of the rake and with the shaft, C, substantially as described and for the purposes set forth.

57,489.—APPARATUS FOR PREPARING PEAT.—Louis Elsbery, New York City.

I claim the combination in a machine of the following implements, viz: the agitator, agitator chamber and steam pipe, all operating in the combination, substantially as set forth.

I also claim the combination in a machine of the following implements, viz: the chamber for the material, steam delivery pipe, and reciprocating piston press, all operating in the combination, substantially as set forth.

I also claim the combination of the piston and piston chamber of the press with a discharge passage composed of sections all operating in the combination substantially as set forth.

I also claim the combination in a machine of the following implements, viz: the agitator, agitator-chamber, steam delivery pipe, and reciprocating piston press, all operating in the combination, substantially as set.

I also claim the combination of the piston and piston chamber of the press with a discharge passage whose interior is tapering; all operating in the combination, substantially as set forth.

57,490.—STEAM-ENGINE GOVERNOR.—Rudolf Eickemeyer, Yonkers, N. Y.

First, A governor consisting of an escapement and a balance making isochronal vibrations connected with the valve, by which the speed of the moter is controlled, so as to regulate the motive power, substantially as herein described.

Second, The combination of the escapement, D, balance, H I, and friction spring, d, or their equivalents, with the valve, in such manner that the latter may cease moving after the supply of motive power has been entirely shut off, and before the normal speed of the motor is restored, substantially as herein set forth.

Third, The arrangement of the lever, L, with graduating weights, connected with the escapement and balance by means of a loose strap, w, substantially as and for the purpose herein specified.

Fourth, The spring, d, applied to produce friction between the escapement wheel and its shaft, and to insure the falling of the pallets of the verge or anchor on the teeth of the said wheel, substantially as herein specified.

Fifth, The counterbalance lever, N, in combination with the valve and escapement, substantially as and for the purpose herein specified.

Sixth, The governor consisting of the escapement and balance, the friction spring, d, weight, s, counterbalance, h', stops, c' d', and their connections, the whole constructed, combined, and applied substantially as herein specified.

57,491.—APPARATUS FOR GENERATING GAS.—J. J. Ensley, New York City.

I claim the construction of the perforated charge cylinder or cylinders, d, open at the inner end, and the horizontal close retort cylinder or cylinders, c, substantially as and for the purpose herein specified.

I also claim the condensing chambers, k k, connected by the pipes, l l, and provided with discharge cocks, n n, when used in combination with the inclosing water tank, B, substantially as described.

I also claim the combination and arangement of the tight bar-

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rel, q, and pipes, p r, with the pipe, n, for the purpose of pumping off the condensed water that gathers, without admitting air or allowing escape of gas, substantially as set forth.

57,492.—Coal and Ash Sifter. — Warren R. Evans, Thomaston, Me.

First, I claim the combination of the ash receiver, B, with its perforated plate, c, with the vessel, A, substantially as specified.

Second, In an ash sifter constructed substantially as set forth, the pins, c c, in combination with the plate, C, substantially as and for the purpose specified.

57,493.—Boot and Shoe Edge Parer.—William Frederick, Ashland, Pa.

I claim an improved boot and shoe edge parer, formed by combining the holder, B, cutter, A, and block, E, with each other, the said parts being so constructed and arranged substantially as herein described and for the purpose set forth.

57,494.—Funnel Measure.—Chauncey W. Fuller, Earlville, Ill.

I claim a measuring funnel constructed with a valve, C, raised by the bent rods, D, with a spiral spring, E, and lever, F, and having also transverse rods, B, for measuring quantities, said several parts being respectively constructed and arranged for use in relation to the funnel and to one another, substantially as set forth.

57,495.—Stem-winding Watch.—E. A. Giles, New York City.

I claim the sleeve, c, and pin, f, combined with each other and with the winding arbor, c, pendent ring, C, and spring catches, n, substantially as herein set forth for the purpose specified.

57,496.—Twine Spool and Stand.—George P. Goodwin, Lowell, Mass.

I claim as a new article of manufacture a twine spool and stand composed of the hanger, bushings, friction centers and thumb screws, all arranged to operate substantially as and for the purpose set forth.

57,497.—Whiffletree.—D. A. Gorham, Lawrence, Mass.

First, The revolving trace hooks, D, and rod or bar, c, constructed as described, in combination with the whiffletree, A, substantially as described and for the purpose set forth.

Second, Connecting the whiffletree, A, to the forward part of the carriage, in such a way that the horse can be released from the carriage in an instant whenever necessary, substantially as described and for the purpose set forth.

Third, The spring pin, H, constructed as described, in combination with the strap, F, slotted bar, G, and lever, E, substantially as and for the purpose set forth.

57,498.—Fastening for Railroad Rails.—E. B. Graff, Baltimore, Md.

I claim a railroad rail, A, having its ends constructed as set forth, in combination with the saddle, D, plate, P, and bolt fastenings, as described, the whole being constructed, arranged, and operated substantially in the manner and for the purpose described.

57,499.—Pump.—John P. Gruber, New York City.

I claim the application of a valve, b, to a rotary spiral flange for the purpose of elevating water, substantially as described.

57,500.—Sewing Machine.—William H. Halsey, Hoboken, N. J., and Maurice Fitzgibbons, New York City.

First, We claim the combination and arrangement of the spring, E, and arm, D, with its cam end, a, constructed and operating substantially as and for the purposes set forth.

Second, Forming the handle of the machine so that it will contain and support the spool, substantially as described.

57,501.—Turn Table.—Freeman Hanson, Hollis, Me.

I claim a turn table operated in an inclosed pit by the weight of the car or engine to be turned, as and for the purpose described.

57,502.—Apparatus for Generating and Burning Gas from Petroleum, Naphtha, etc.—Mark E. Hanson, Newport, Me.

I claim the hereinbefore described arrangement of a gas generator and burner consisting of the generator a a, with the ribs, b, the eduction pipe, d, perforated cap, f, together with the hinged spring, h, and pin, i, the said several parts being constructed and the whole combined for use, substantially as and for the purpose set forth.

57,503.—Lock.—William W. Hardee, New York City.

I claim the combination of the doubly-hooked tumblers, D E F G, key and rotating slotted post, L, when constructed, arranged, and operating as and for the purpose set forth.

57,504.—Car Coupling.—Andrew Hartman, Canton, Ohio.

I claim, First, The arrangement of the hook, D, the crank rod, E, the rod, F, with its stop, and the plate, G, constructed and used as and for the purpose specified.

Second, The arrangement with the bumper, A, of the springs, B and C, with their ends forming portions of bottom and top of the receding mouth, as and for the purpose specified.

Third, The arrangement of the crank shaft, I, provided with prongs, J J, with the spring, C, and hook, D, the several parts being constructed substantially as and for the purpose specified.

57,505.—Uterine and Abdominal Supporters.—Joseph S. Havens, T. M. Johnson, and C. W. Howe, Buffalo, N. Y.

We claim, First, In providing the joint of the uterine supporter with a rack, a set screw, and a segment of a pinion, as described, by means of which it may be either locked in position or swung loosely upon the rod, U, as described.

Second, In making the tube, P, with the supporting ring, L, adjustable vertically by means of the set screw, Q, and the tube, P', as described.

Third, The combination of the ring, M, with the ring, L, of said supporter, when constructed as and for the purposes set forth.

57,506.—Pipe Tongs.—Henry Herbert, Cincinnati, Ohio.

First, I claim the adjustable pipe tongs constructed with a toothed pin, C G, substantially as and for the purposes set forth.

Second, I further claim the adjustable gage, consisting of the sliding collar, O, and set screw, N, when constructed and arranged to operate as and for the purposes specified.

57,507.—Tug Buckle.—Henry Hise, Ottawa, Ill. Antedated Feb. 28, 1866.

I claim as an article of manufacture a buckle composed of the two parts, A and C, when the former has a projecting pin, a, and is secured to the latter by means of a spring, G, attached to C, said frame, C, having at its end, L, a loop, to which the tug strap is attached, so that the other part of the frame, C, remains uncovered, all said parts being constructed in the manner and operating substantially as described and for the purpose set forth.

57,508.—Lock.—E. R. Hopkins, New York City.

I claim the combination with the handle shaft and the bolt of a lock of two separate series or sets of concentric rings or disks, one of which series, by its holder or frame, is so connected with the handle shaft as to always turn with it, while the other series is susceptible of being brought in connection with or disconnected from the said first series, when the two series of rings or disks are so constructed and arranged with regard to each other and with the handle shaft and lock casing as to allow the bolt of the lock to be drawn out or thrown in only by properly moving the handle therefor, after said disks have been brought to certain positions with regard to each other, substantially as herein described, and for the purposes specified.

I also claim adjusting the operating parts of the lock herein described for throwing its bolt in accordance with a graduated disk attached to the handle shaft, and turning in connection with it and the annular fixed graduated ring of the lock casing, when such graduations of the said disk and ring are so arranged with regard to each other that only one of the said graduations of both the ring and disk can coincide with each other at one and the same time, substantially as herein described and for the purpose set forth.

57,509.—Automatic Steam Valve.—George W. and Elisha Hopkins, Brooklyn, N. Y.

We claim the combination with a piston valve constructed substantially as described, of the sliding rings, S S', arranged and operating in connection with the valve heads and their necks, to produce the operation of the valves by steam from the cylinder, essentially as herein set forth.

57,510.—Calendar Clock. — Henry B. Horton, Ithaca, N. Y.

First, I claim the cam or sliding surfaces on the month cam, I, for the purpose of sliding or revolving the thirty-one-days wheel the distance of one day, for the object described; and the said surface for one day's advance of the said wheel for any other purpose connected with the supernumerary days of a calendar clock.

Second, I claim making a four, eight, twelve or more year wheel, containing virtually the uses and position of the wheel, P, moved by the pin or part, P c, or equivalent, and controlled by the bent rod, a, or equivalent, and its surfaces, P a and P b, etc., as described. And I claim the wheel, P, when made of eight slots, six plain and two irregular surfaces, as described, or other correlative number of parts, periphery, slots, and surfaces, when made substantially as described. And I claim the February cam, c c', constructed on the year cam, Z, for leap year, as described, both when used in combination with the wheel, P, and when used with any other device or mechanism in place of the wheel, P.

Third, I claim the immediate contact, or other suitable connection, of the pawl, n a, with the pawl, K, for the purpose of rendering its action more sure, as described; and the so shaping the upper surface of the pawl, n a, as to act as a cam surface with the pawl, K, and thus be in mutual relation at all times to each other, as described.

Fourth, I claim attaching the lever, S, to the weight lever, n, in such a manner as to receive the action of the eccentric, A, by the rod, B, and by its cam surface, S a, to carry the pawl, K, over the teeth of the thirty-one-days wheel, as described. And I claim the lever, S, or its equivalent, for the purpose of raising a pawl over one tooth of the thirty-one-days wheel, and also of the year wheel and of the days of the week wheel, while in the act of making their changes. And I claim the raising or tilting of the stop pawl, K, or correlative pawls of the week and year wheels over the teeth acted on by the same, when produced by the fall in changing of their respective rods or levers.

Fifth, I claim making the pawl, T, with a slot in it for receiving the lever of the month cam, thus simplifying and making more sure in action the devices connected therewith.

57,511.—Clock Case.—Henry B. Horton, Ithaca N. Y.

First, I claim the combination of the two cast frames, one for the back and the other for the front of the case, with the interposed piece or part between them, as described.

Second, I claim holding the cast frames and middle piece together by the bolts or rods, G, or other equivalent device, as described.

Third, I claim the use of the wooden plugs, in connection with the connecting rods or bolts, for the described purposes and uses, and the use of the said wooden plugs in the holes of the frames for adjusting the fronts and backs when the rods are not used.

Fourth, I claim the combination of frames and interposed middle piece, rods and wooden plugs in the said holes, the same making a whole, as described.

57,512.—Hydraulic Engine. — Horace Hubbell, New Haven, Conn.

I claim the combination of the cylinders and their appendages with the sector and its appendages, when the whole is so constructed, arranged, and fitted that the jet of water will alternately be forced into the lower end of one cylinder to act on and elevate its piston, while the lower end of the other cylinder will be entirely open for the discharge of the water and the descending of the piston, substantially as herein described and set forth.

57,513.—Cutting Board.—Roland C. Hussey, Milford, Mass.

I claim the manner of clamping together two or more seasoned sections, A B, that is, by using two bars, C, and rods, D, carrying nuts, c, by which the section may be held closely together, substantially as specified.

57,514.—Sewing-machine Bobbin. — Cornelia F. Ingraham, Indianapolis, Ind.

I claim constructing the bobbin of a sewing machine substantially in the manner and for the purpose above set forth.

57,515.—Vault Light.—George H. Johnson, Baltimore, Md.

I claim the combination of inverted or centrally enlarged girders, c c, with elongated glasses, A A, in the construction of a vault cover, substantially in the manner and for the purpose herein described.

Also, the arrangement and combination of retaining strips over and upon the joints of the glasses and frame of an illuminated vault cover, to secure said glasses and protect the joints from moisture, substantially in the manner herein set forth.

57,516.—Pump.—Niels Johnson, Ripon, Wis.

I claim the arrangement of chambers, K and M, with the sucker, G, and valves, E H and I, substantially as and for the purpose herein specified.

57,517.—Centrifugal Machine.—Jacob O. Joyce, Dayton, Ohio.

I claim, in combination with a centrifugal sugar separator, a revolving feeder, operating substantially in the manner and for the purpose described.

57,518.—Steam-engine Valve.—Wm. A. L. Kirk, Hamilton, Ohio.

First, I claim the combination of the valve chamber, A, and continuously revolving valve, H, provided with ports, substantially as described, and for the purpose specified.

Second, The combination of the cut-off valve, L, with the chamber, A, valve, H, and its ports, constructed and operating substantially as and for the purpose specified.

57,519.—Dress Elevator.—G. Kammerl and D. L. Bollermann, New York City.

We claim the combination of the supplemental operating cords, h, with the lifting cords, n, and the operating cords, g, substantially as herein set forth, for the purpose specified.

57,520.—Horse Rake.—Chas. Kugler, Cadiz, Ohio.

I claim the combination of the jointed parts, d d', front foot-piece, c, rear foot-piece, c', cross-bar, G, and arm, F, of the rake head, D, arranged and operating substantially as described, for the purpose specified.

57,521.—Handle for Cutlery.—Taylor D. Lakin, Hancock, N. H.

I claim the central cast-metal plate, A, cast on a core to form a longitudinal taper opening, a, to receive the tang, B, of the blade, and also cast with projections, b c d, at each side, in combination with the side-piece, D D, secured to A by rivets, and the tang also secured in the opening, a, by rivets, substantially as and for the purpose herein set forth.

57,522.—Machine for Holding the Heads of Casks.—Joseph D. Leach, Penobscot, Me.

I claim the disks, O and P, in combination with the pin, W, constructed and operating substantially as and for the purposes specified.

Second, A heading holder, having levers, B and C, spring, E, ratchet, I, treadle, H, disks, O and P, and pin, W, constructed, combined, and arranged substantially as and for the purposes set forth.

57,523.—Evaporator.—J. Little and S. W. Little, Patoka, Ind.

First, We claim the central supporting framework, E, in combination with the reels, B, pan, D, and adjustable leg, F, constructed and operating substantially as and for the purpose described.

Second, The flaring sides of the arch, with recesses or grooves, a, in combination with the pan, D, substantially as and for the purpose set forth.

Third, The skimming shelves, g, in the pan, G, as described.

Fourth, The V-shaped shelves, i, in the compartment, H, as set forth.

Fifth, The straining shelves, k, and box, l, in the compartment, I, as and for the purpose described.

57,524.—Machine for Applying Screw Mouth-pieces to Cans, etc.—Henry O. Lothrop, Milford, Mass.

I claim the mouth-piece supporting machine, as composed of the jawed plates and the shelf, made, arranged, and combined substantially as specified.

I also claim the arrangement and combination of the lever, K, with the handle, I, and the spring catch, H, applied to the two jawed plates, as specified.

57,525.—Hay-stacking Device.—William Louden, Fairfield, Iowa.

First, I claim the bracing of the upright, A, of the crane by means of the bars or braces, B C C, arranged substantially as described.

Second, The sweep, M, provided with the pendent pin, e, in connection with the arm, J, and fork tackle, all arranged to operate substantially as and for the purpose set forth.

Third, The arranging of the crane and tackle relatively with the arm, J, and with the stack and load, in such a manner that the fork in ascending and descending will, under the pull of the tackle, swing from the load over the stack and vice versa, substantially as described.

57,526.—Water-closet Valve.—Archibald and James Loudon, Boston, Mass.

We claim the combination of the passage, a, through the spindle or post, G, with the regulating screw, M, provided with a recess, e, as described.

Also, the combination of the cushioning channel, c, and its opening, b, with the valve, B, and its seat, I, when combined with the valve, D, and the chamber, A, so as to operate therewith, as specified.

57,527.—Bronzing Machine.—John K. Lowe, Cleveland, Ohio.

I claim the bronze box, F, feed roller, F', and handle, G, in combination with the bronzing fur roller, B, as and for the purpose set forth.

Second, I claim the revolving brush, E, and cleaning roller, D, in combination with the sheet roller, C, and bronzing roller, B, arranged in the manner and for the purpose substantially as set forth.

Third, I claim the belts, H H', and pulleys, d e f f' a' b b', in combination with the sheet roller, C, arranged and operating in the manner and for the purpose set forth.

57,528.—Composition for Putty.—John and William H. Lucas, Philadelphia, Pa.

We claim the composition of ground marble, whiting, and linseed oil to form a superior putty, substantially in the manner hereinbefore described.

57,529.—Screening and Sifting Apparatus.—Sebeus C. Maine, Boston, Mass.

I claim as an improvement in apparatus for screening and sifting for family use, the shaft, B, constructed with its guide plates, E, or their equivalents, for receiving and operating a selve or screen of any size or form, substantially as described.

I also claim for family use a selve or screen with its removable bottom in combination with a receptacle provided with a shaft operated by a cam, C, or its equivalent, substantially as set forth.

57,530.—Railroad Wedge Rail.—W. M. Martin, New York City.

I claim the wedge-shaped auxiliary rail with a curved face and three downward-bearing surfaces, one bearing on the clamp, D, one on the bottom of the chair, and one, which is curved lengthwise, upon the lower flange of the rails, substantially as and for the purposes herein set forth.

57,531.—Pump Piston.—Sylvester G. Mason, Elbridge, N. Y.

I claim the combination of the segmental side valves, D D, with the central plane-sided chamber, G, said parts being arranged in connection with the inclosing rim, A, and cover, C, as described, and the whole operating as set forth.

I also claim the construction of the segmental valves with plane sides and a circular rim or edge, as described, for the facilities of manufacture, as set forth.

57,532. — Carpet-cleaning Machine. — William McArthur, Philadelphia, Pa.

First, I claim the combination, substantially as described, of a steam pipe, G, or other equivalent heating apparatus, with a carpet-beating machine, for the purpose described.

Second, The combination of the beaters, H, their spiral springs and the roller, F, with its pins, n, the whole being arranged and operating substantially as and for the purpose specified.

Third, The inclined plates, i i, beaters, H, brush, J, and rollers, B B' c c' d and e, the whole being constructed and arranged for joint operation, substantially as and for the purpose specified.

57,533.—Machinery for Cutting Oval Holes in Boiler Heads.—James McBride, Alleghany City, Pa. Antedated Aug. 17, 1866.

I claim the combination and arrangement of the wheels, k and j, shafts, h and i, disk, g, table, c, pitman, e, wrists, o, slots, f, and cutter, x, combined, arranged, and operating substantially in the manner herein described and for the purpose set forth.

57,534.—Machinery for Cutting Oval Holes in Boiler Heads.—James McBride, Alleghany City, Pa. Antedated Aug. 17, 1866.

I claim the combination and arrangement of the wheels, l m n and o, shafts, h i and k, disk, p, slot, Q, wrist, q, pitman, E, head piece, f, and cutter, g, constructed, arranged, combined, and operating substantially as herein described and for the purpose set forth.

57,535.—Hoisting Machine. — James McCalvey, Philadelphia, Pa.

First, I claim the combination of the grip levers, I, spring, K, keys, L, and springs, M, arranged and operating in relation to each other and to the permanent ratchets, E, substantially in the manner hereinbefore described and for the purpose set forth.

Second, The combination of the trip levers, H, with the yoke, F, beam, C, and grip levers, I, substantially as described and for the purpose specified.

Third, The combination of the spring, O, with the beam, C, and yoke, F, for giving an instantaneous drop to the latter when the rope or chain breaks and thus throwing the grip lever, I, instantly into connection with the permanent ratchet, E, to securely lock the cage, A, substantially as described.

57,536.—Drilling Attachment for Turning Lathes.—James McCrum, Locust Grove, Ohio.

I claim the sliding rod, I, with the spring, O, and weighted cords, L, either or both applied to it, in connection with an adjustable stop mechanism composed of the bar, K, attached to the rod, I, and a head, i, on the slide, Q, all being arranged and applied to the puppet head of a lathe, to operate in the manner substantially as and for the purpose set forth.

I also claim the calipers, P, applied to the tube, E, and slide, Q, in combination with the drilling attachment, substantially as and for the purpose specified.

I also claim the particular arrangement of the slide, Q, tube, E, vise, J, spring, O, and weighted cords, L, with the puppet head, C, of a lathe or drilling mandrel, substantially as and for the purpose set forth.

57,537.—Farm Gate.—David McCurdy, Ottawa, Ohio.

I claim as an improvement in gates the arrangement of the post, A, roller, d, and pin, o, in combination with the extension arm, f,

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latch, n, slotted swiveled post, l, roller, m, bars, a, and post, A2, constructed and operating in the manner herein specified and described.

57,538.—Wagon Brake.—John S. McGlumphy, Wind Ridge, Pa.

I claim in combination with the rubbers, F, and levers, D, the bifurcated bar, C, and adjusting nuts, E, the same being respectively attached to the lower end of the king bolt, B, and to the brake levers, D, substantially as and for the purpose set forth.

57,539.—Seal Lock.—Ward McLean, New York City.

I claim a lock whose bolt has two catches which simultaneously engage with or disengage from the hasp and from the seal cover so that a seal cannot be removed from the lock without unlocking the same, substantially as described.

57,540.—Banjo.—George Mein, Williamsburgh, N. Y

I claim, First, The interior rim, c, in combination with the exterior rim, A, and with the head, B, of the banjo, substantially as described and for the purpose set forth.

Second, The manner of attaching the stem, I, to the rim, A, with a dovetailed groove and strip, substantially as herein described and for the purpose set forth.

57,541.—Thrashing Machine.—James H. Melick, Albany, N. Y.

I claim, First, a series of bars each fitted to yield separately and radially and forming the concave or rubber, in combination with the revolving thrashing cylinder, as set forth.

Second, I claim a yielding incline, d, between the feeding table and the concave or rubber, substantially as and for the purposes set forth.

Third, I claim the arrangement of the slides, k, springs, l, and adjusting screws, l, to the yielding bars, f, of the concave or rubber, as specified.

57,54 .—Tool for Splitting Bark upon Trees.—E. Michaels, Palermo, Me.

I claim a tool for peeling off the bark of trees, consisting of the shank, A, the three-edged knife, B, handle, C, two hand rollers, a and E, substantially as shown and described.

57,543.—Apparatus for Carbureting Air.—Patrick Mihan, Boston, Mass.

I claim, First, An apparatus for carbureting air, conducting the air to be treated through an inlet tube, M, placed about the shaft of the apparatus and terminating near the remote end of the apparatus in a cone-shaped mouth, M', so as to increase the distance to be traversed by the air after it is delivered within the generator, substantially as shown.

Second, I also claim in an apparatus for carbureting air, the use of open tubes supplied with bristles, or their equivalent, revolving through or in a bath of hydro-carbon and exposed, on emerging therefrom, to currents of air, substantially as shown.

Third, I also claim the cover, Q, with its outlet pipe, Q', its cones, P and O, and tubes, U, constructed and arranged substantially as shown and described.

Fourth, I also claim forming a space, V, for receiving the carbureted air, in combination with the tubes, C, and the cone, O, and tubes, U, substantially as shown.

Fifth, I also claim covering the tubes, C, with an absorbing material for the purpose of exposing to the fresh air a surface or surfaces wet with hydro carbon, while such air is on its way to the end of said tubes, substantially as shown.

57,544.—Stovepipe Damper.—Richard S. Miller, Battle Creek, Mich.

First, I claim the construction and arrangement of the two inverted half cones, C C', pivots, b b, crank shaft, B g, and link, h, in combination with the stove pipe, A, as herein described and shown for the purpose set forth.

Second, The combination of the pivots, b b, notches, e e, and rock shaft, B g, in the construction of a damper formed of two inverted half cones, and arranged in a stove pipe, all as herein described and for the purpose set forth.

57,545.—Burial Case.—William K. Miller, Canton, Ohio.

I claim making and carbonizing burial cases of wood, as and for the purpose substantially as herein described.

57,546.—Water Elevator.—Jacob E. Moeller, Terre Haute, Ind.

I claim the combination of the bucket, E, strap, D, pulley, C, ratchet wheel, R and m, crank, K, and spring catch, n, the whole being constructed, arranged, and operated substantially in the manner and for the purpose set forth.

57,547.—Wrench.—Isaac Morris and C. M. Morris, Fair Haven, Conn.

I claim the combination of the movable jaw, and vibrating rack, with the main rack, and enlargement of the bar, near the stationary jaw, when the whole is constructed and fitted for use, substantially as herein described and set forth.

57,548.—Carriage.—J. J. Morris, New Bedford, N. J.

I claim, First, The independent axle, C, having the hub and wheel attached permanently thereto, and revolving with the wheel, substantially as set forth.

Second, The independent axles constructed as set forth, in combination with the sleeve, H, when arranged to operate as shown and described.

Third, In combination with the axles, C, as described, I claim the friction rollers, a, arranged and operating as set forth.

Fourth, I claim the combination of the brace, o, hook, h, and spring, m, when said parts are arranged in connection with the vehicle, as shown and described.

57,549.—Reaping Machine.—Robert Morris, Salem, Ind.

I claim, First, The square, h, and spring, H, operating with the discharger, F, substantially as and for the purpose specified.

Second, The index, K, and set screw, I, in combination with the spring, H, arranged with the bar, G, and square, h, substantially as described for the purpose specified.

57,550.—Dry Dock.—John W. Munger and W. O. Jones, Portland, Me.

I claim, First, The combination and arrangement of the docks, D 1 2 3 4 5 6, with the channel, B, and central basin, A, as and for the purposes set forth.

Second, The arrangement and construction with the docks, as described, of the cisterns, 7 8 9 10 11 12, in the manner and for the purposes set forth.

Third, In combination with the docks so arranged and constructed, the ways and carriages, outlets and gutters, as and for the purposes set forth.

57,551.—Apparatus for Generating Illuminating Gas.—Henry B. Myer, Philadelphia, Pa.

I claim, First, The arrangement of the chambers, A B C D, in their relation to each other, for the purpose specified.

Second, In combination with the chambers, A B, I claim the pipe, b, and valve, b', constructed and operating substantially as and for the purpose set forth.

Third, I claim the herein described construction and arrangement of the pumps, E F, the same being adapted to the use of water as a packing, as specified.

Fourth, I claim such a structure of the pump, as shown in Figs. 18, whereby it is adapted to the use of quicksilver as a packing, as specified.

Fifth, I claim in combination the perforated coil, C', double disk, d, and perforated disk, I, arranged to operate as specified.

Sixth, In combination with the chambers, A B C, I claim the glass tube indicators, a' b''' k, as and for the object set forth.

Seventh, I claim operating the valve, b', by means of the float, B', as and for the purpose herein specified.

Eighth, I claim the arrangement of the pumps, E F, train of wheels, G, ratchet wheel, R, lever, Q, and gas holder, O, as and for the purpose herein specified.

57,552.—Harvester.—Wales Needham, Rockford, Ill.

I claim, First, The head, H', spool, K, face plate, J'', in combination with the arbor, m, crank, P, spring, i, reins, a' a'', arranged as and for the purpose set forth.

Second, The arm, B, rest, E, lever, P, tooth, e', spring, d, in combination with the spool and reins, arranged as and for the purpose specified.

Third, The standard, A, and arm, B, in combination with the serrated coupling, C, and rest, E, as and for the purpose set forth.

57,553.—Fruit Picker.—John Neff, Jr., Pultney, N. Y.

I claim the blades, A and B, when made substantially as specified, also the griper, C, and spring, D, when made and applied as specified, and used for the purpose set forth.

57,554.—Hat.—William S. Nelson, St. Louis, Mo.

I claim the arrangement of the band, A, the connected side frames and rim frames with the hoops, E and G, substantially as described and for the purpose herein set forth.

57,555.—Covered Button.—Nelson C. Newell, Springfield, Mass.

I claim the disk, C, formed in such a manner that when inserted in the button it may be expanded laterally, substantially in the manner and for the purpose herein described.

57,556.—Saw Mill.—Isaac H. Newton, Oakfield, Mich.

I claim the bars, G, arms, H, and frame, I J K, combined with each other and arranged in relation to the head and tail blocks, B B', substantially as herein set forth for the purpose specified.

57,557.—Sorghum Stripper.—David H. Nichols, Richmond, Ohio.

I claim the combination of the sliding plates, F, stationary plate, B, provided with apertures, c, and the springs, d, the whole being constructed, arranged, and operating substantially as herein set forth for the purpose specified.

57,558.—Piano.—John W. Otto, St. Louis, Mo.

I claim, as my improvement in the pianoforte in general, and also in the grand pianoforte in particular, First, The particular manner in which the case of the piano (including wrest-plank, iron frame, plane of stringing and soundboard) is inclined contracted, elevated, and the area of the soundboard enlarged for the purpose of attaining convenient dimensions, a more effective soundboard, and other improvements resulting from this transformation, and claimed herein separately, substantially as described.

Second, The removable end casings, F F, as described and for the purpose specified.

Third, The removable back casing, g, as described and for the purpose set forth.

Fourth, The key lid, k, its joints, n n, and their connecting rod, m, arranged as described and for the purposes specified.

Fifth, Apertures, r, in the soundboard, serving as passages through which the damper movement is transmitted, as set forth.

Sixth, The soft-pedal arrangement by means of a pointed rail, J, and india-rubber slips, K, or its equivalent, substantially in the manner and for the purposes set forth.

Seventh, Setoffs, M M, on each side of the keyboard, in the manner set forth and for the purpose specified.

57,559.—Disinfector.—J. D. C. Outwater, New York City.

I claim the combination of the glass vessel, C, with a depression on its bottom, and a metal cap furnished with hollow arms, the whole being adapted to revolve in adjustable bearings in a frame, substantially as described and represented.

57,560.—Bed Bottom.—Joshua D. Patton, Davenport, Iowa.

I claim a bed bottom composed of a series of cords or other lines, c, secured at one end to the frame of the bed bottom and passing loosely through the other, having heads, E, upon their outer ends, substantially as and for the purpose described.

57,561.—Medicine.—W. Petre, New York City.

I claim the within described medical composition, made of the ingredients in the manner and proportion as set forth.

57,562.—Cultivator.—Michael Porter, C. E. Jenkins, and G. F. Jenkins, Terre Haute, Ill.

I claim the combination of the adjustable swivel brackets, a, plow beams, E E, and axle, A, arranged and operating in the manner as and for the purpose herein specified.

57,563.—Corn Cultivator.—H. S. Potter, Fairfield, Iowa.

First, I claim the frame, A, with the driver's seat, B, placed on its rear end, and connected at its front end to the hounds, D, of the draught pole in front of the axle, E, substantially as and for the purpose set forth.

Second, The frame, J, in combination with the plow beams, L L, connected by swivel joints to the rod, K, above the axle, E, arranged in connection with the frame, A, to operate substantially as and for the purpose specified.

Third, The lever, Q, attached to the front part of the frame, A, and applied to or arranged in connection with the frame, J, and the loop, l, with roller, m, substantially as and for the purpose set forth.

Fourth, The connecting of the plow standards, G M, to the frame, A, and beams, L, by means of the pivoted bars, b g, provided with wheels, c h, substantially as and for the purpose specified.

57,564.—Knife and Scissors Sharpener.—T. T. Prosser and James Lawson, Chicago, Ill.

We claim the toothed disk, B, in combination with the frame, A, having the notch, e, formed therein, when said parts are arranged to operate as and for the purpose set forth.

57,565.—Saw Mill.—Paul Pryibil, New York City.

First, I claim the changeable guide, F, for the purpose set forth.

Second, The construction of the guide, F, with shoulder, e, screw, f, nut, h, spring, j, and jaws, c d, substantially as and for the purposes described.

Third, The yielding spring arms, b, or their equivalent, in combination with the adjustable journal box of the shaft, B, substantially as and for the purpose set forth.

57,566.—Car Coupling.—Samuel Y. Quest, Wellsburg, W. Va.

I claim the combination of the levers, G G' H J K and M, together with the inclined plane, N, when properly constructed and adapted to each other, so as to secure the object proposed substantially as hereinbefore explained.

57,567.—Blacking.—W. F. Quinby, Wilmington, Del.

I claim a blacking composed of the within ingredients in the manner and about the proportion, substantially as described.

57,568.—Potato Digger.—George Ray, Kinderhook, N. Y.

First, I claim the horizontal rotating cutters, C, fixed cutters, C', and guard, C*, arranged in combination with each other and with the shovel plow, D, substantially as herein set forth for the purpose specified.

Second, The suspended plate, D*, combined and in relation with the vibrating screen, D', and with the buckets of the endless elevating apron, u u', substantially as herein set forth for the purpose specified.

Third, The endless elavating apron u u', furnished with buckets as described and arranged in relation with the vibrating screen, G, and the hopper, F', substantially as herein set forth for the purpose specified.

Fourth, The arrangement of the platform, H, at the rearmost end of the machine and in relation with the hopper, F', and vibrating screen, G, substantially as herein set forth for the purpose specified.

Fifth, The suspension of the shovel plow, D, from the vertically pivoted frame, B', to enable the said plow to be turned laterally when desired, substantially as herein set forth.

Sixth, The lever, k, short levers or arms, j, links, i*, and chains, l', arranged with reference to each other and with the bars, i, of the plow D, and the rearwardly projecting end of the draught pole, B, substantially as herein set forth for the purpose specified.

Seventh, The supplemental tilting frame, F, sustaining the platform, H, and so arranged upon the rearmost end of the machine and combined with suitable operating mechanism, that its rearmost end will be raised simultaneously with the elevation of the forward end of the machine, substantially as herein set forth for the purpose specified.

57,569.—Propeller for Canal Boats.—Ebenezer Raynale, Birmingham, Mich.

I claim a vessel constructed with a submerged recess, A, at the stern divided through part of its length by a partition, B, and having in one of its compartments, A2, a reciprocating propeller, D constructed with valves, E, the said parts being respectively constructed and arranged for use, substantially as set forth.

57,570.—Valve for Water Closets.—Joshua Regester, Baltimore, Md.

First, I claim constructing a valve, G, of the parts, g h and i, and arranging it within a box through which water flows, substantially as described.

Second, The continuation of the enlarged cupped portion, g, having flattened spaces, l, and the reduced cylindrical guide, h, with the packing, i, said parts being arranged within a chamber A, and above the outlet chamber, substantially as described.

Third, The stem, D, constructed with the parts, d, on it as described in combination with the device, h J, in the manner and for the purpose described.

57,571.—Machine for Grinding Tools, etc.—N. B. Reynolds, Auburn, N. Y.

I claim in combination with a revolving grindstone a tapping instrument which on being vibrated hacks the surface of the stone and thus prevents it from glazing or polishing, constructed and operating substantially as herein described.

I also claim in combination with a pair of clamping tongs that are pivoted to a plate or rest traversed by grinding ways which extend past the face of the stone, a tappet or cam, m, for vibrating said tongs upon its pivots, substantially as herein described.

57,572.—Stovepipe Drum.—Francis E. Ruth, and Jos. De Long, Upper Sandusky, Ohio.

First, We claim the combination of the interior tapering or thimble-shaped tube, F, with the exterior drum, A, and interior central pipe, I, substantially as herein described and for the purpose set forth.

Second, The combination of the disk-shaped damper, J, rod, K, and lever, L, with each other and with the outer cylinder, A, the interior tapering tube, F, and the interior pipe, I, substantially as described and for the purpose set forth.

57,573.—Churn.—Geo. H. Sanborn, Boston, Mass.

I claim the arrangement of the two sets of floats, 1 and 2 and 3 and 4, in the manner and for the purpose set forth when combined with the truck, C, the shaft, A, and the cream box, B, as shown and set forth, as also the use of the arms, k k k, and the projections, l l l, when arranged and used as shown.

57,574.—Lock.—James Sargent, Rochester, N. Y.

I claim the rotating tumbler, I, when separated and isolated in action from the permutation wheels, and so arranged that any inward pressure upon the bolt will be exerted on the bearing of said tumbler, and have no action nor effect upon the said permutation wheels, substantially as and for the purpose herein specified

I also claim in combination with the turning tumbler, I, the cog bar, H, and lever, G, arranged as operating as herein set forth.

I also claim the combination and arrangement of the wheels, C, cam disk, E, pivoted lever, G, cog bar, H, and turning tumbler, I, the whole operating as herein specified.

57,575.—Steam Generator.—Herrman S. Saroni, Marietta, Ohio.

First, I claim the arrangement of the feed water pipe in a coil beneath the boilers in and around the burners, as and for the purpose described.

Second, The combination substantially as described of the boiler, the branch pipe, the feed water pipe, and the burners, for the purpose of securing a circulation in the boiler, as set forth.

Third, The arrangement of the burner with its conductors in contact with the boiler, so that the boiler forms the heater cap for the burner.

57,576.—Feed-water Heaters for Steam Generators.—Herrman S. Saroni, Marietta, Ohio.

First, I claim the generator drum, A, arranged between the feed pump and boiler, as described.

Second, The arrangement of the drum and burner so that the drum serves as the heater-cap for the burner, as described.

Third, The arrangement of the drum, the burner and the feed pipe, substantially as and for the purpose described.

Fourth, The combination substantially as described of a series of generators or drums each having its own burner and entrance and exit pipe, but all having the same main feed pipe and escape pipe.

57,577.—Apparatus for Steaming Vegetables, etc.—Herrman S. Saroni, Marietta, Ohio.

I claim as a new article of manufacture, a steaming apparatus, having one or more apertures, each or all of them covered with a hood, as above described, connecting with a boiler, for the admission of steam, and a separate pipe for the escape of the water of condensation.

57,578.—Vapor Burner.—Herrman S. Saroni, Marietta, Ohio.

First, I claim a vapor burner having a series of conductors surrounding the jet, but without a heater cap, substantially as and for the purpose described.

Second, The combination of the burner and conductors with removable ring and heater cap, substantially as and for the purpose described.

Third, As a new article of manufacture, a vapor burner or heater having the upper or heat generating portion made of metal of high conducting power, while the lower or fluid converging portion is made of metal of lower conducting power, as described, for the purpose of concentrating the heat at the generating or vaporizing point.

57,579.—Steam-engine Slide Valve.—Thomas Sault, New Haven, Ct.

First, I claim a valve suspended from the axles of the rollers, substantially in the manner and for the purpose herein set forth.

Second, The adjustable saddle plates, m m', adjusting screws, n n', and bridge pieces, l l', in combination with the slide valve, rollers and axle, substantially as described, for the purpose specified.

57,580.—Grain Meter.—William Schnebby, Hackensack, N. J.

I claim a grain meter so constructed and combined with a velocity-registering apparatus that the velocity which a body of grain moving through the meter imparts to its grain wheel will be correctly registered, whereby the weight of the grain which has thus passed through the machine may be correctly ascertained.

Second, I claim a grain hopper and trough supported upon a shaft or journals, upon which they may oscillate, in combination with a grain wheel, so that a quantity of grain moving in said hopper and trough and upon said wheel will have the effect to start, operate, and stop a velocity-registering apparatus, by which means the weight of different qualities of grain may be correctly determined.

57,581.—Fence.—Conrad Seabaugh, San Antonio, Texas.

First, I claim an improved fence formed by securing the rails, B, to the posts, A, with wires, C, said wires being arranged and applied substantially as described and for the purpose set forth.

Second, Securing the ends of the rails, B, to the posts, A, by a series of receivers formed of a single wire, C, extending from the bottom to the top of the post, said wire being attached to the post either by passing it through the post or securing it with nails, substantially as described and for the purpose set forth.

Third, Forming each receiver of a separate piece of wire, the

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ends of which are passed through the post and secured thereto, substantially as described and for the purpose set forth.

57,582.—CHURN.—Oran W. Seely, Buffalo, N. Y.

I claim the removable and adjustable dashers when used in combination with one or more washers, as herein substantially set forth.

I also claim the wedge and openings, in combination with the removable and adjustable dashers and washers, for the purpose and substantially as herein described.

57,583.—HARVESTER.—John F. Seiberling, Akron, Ohio.

I claim the arrangement of the cut-off rod, D, with the crank arm, G, and arm, I, substantially in the manner described, so that the first movement of the rod in falling will be downward and away from the leaning grain, substantially as and for the purposes set forth.

57,584.—BUTTON-HOLE CUTTER.—G.H. Seymour and W. R. Barnard, Waterbury, Ct.

We claim one or more set screws so combined with one-half or division of a pair of shears as to work through said division against the bearing surface of the other division, to determine the lateral adjustment of the two, and of the cutting blades thereof, with reference to each other, substantially in the manner as herein set forth.

We also claim an adjustable bearing strip or washer upon one division of a pair of shears combined with two set screws in said division, bearing against said strip or washer, substantially in the manner and for the purpose herein described.

57,585.—SHUTTLE CARRIER FOR SEWING MACHINE.—John Shellenberger, Hampshire, Ill.

I claim the shuttle carrier, A, made substantially as described, with a socket near its rim for the shuttle, and a hinged gate, D, which confines the shuttle and covers the bobbin, said gate being provided with suitable means for locking and unlocking the same, as above set forth.

57,586.—MACHINE FOR SAWING STONE.—Simeon Sherman, Weston, Mo.

First, I claim the bed, K, hung or arranged substantially as shown and described, to admit of being turned and also of being adjusted out of a horizontal plane, for the purpose specified.

Second, The spring, N, and patterns, M M, in combination with the frame, F, and the frame, G, provided with the saws, H, substantially as and for the purpose set forth.

Third, The sleeve, a, applied to the shaft, B, in combination with the cords or chains, I, counterpoise, E, and suspended frame, F, containing the saw frame, G, substantially as and for the purpose specified.

57,587.—LAMP.—A. G. Smith, Jersey City, N. J.

I claim the reversible burner, B, constructed substantially as described, to be used in lamps or lanterns, as set forth.

57,588.—CALIPERS.—Philo Soper, Buffalo, N. Y.

First, I claim placing a yielding foot on one of the legs of a calipers, substantially as above set forth.

Second, I also claim the supplementary index, D, for indicating the movements of the yielding foot, substantially as described.

Third, I also claim the combination of the yielding foot, A, to arm, H, and the thumb set screw, J, substantially as set forth.

Fourth, I also claim the combination of the graduated table, C, the index, D, and the yielding foot, A, substantially as shown.

57,589.—LAMP.—Thomas E. Sparks, Norwich, Conn.

I claim the combination, as well as the arrangement, of the elevator or wire, i, with the lamp, A, and the tube, B, applied to the wick tube of such lamp, in manner and so as to operate substantially as described.

I also claim the combination of one or more standards, g g, or the equivalent thereof, with the lamp, A, the tube, b, and a mechanism applied to such tube for suspending or supporting it, whether such mechanism be composed in part of the flame guard, B, or the same and the disk, c, or be otherwise properly constructed so as to hold up the tube and allow the lamp and its wick to descend within the said tube for reduction of the flame, as specified.

I also claim the combination of the flame guard, B, with the tube, b, and the lamp.

I also claim the combination of the disk, e, with the flame guard, B, the tube, b, and the lamp.

I also claim the combination of both the elevator and the bail (or their equivalents) with the lamp and the slide tube, b, provided with means of arresting the upward motion of such tube on and applied to the wick tube so as to operate with respect to the wick thereof, substantially as specified.

I also claim the combination of the flame guard, B, or the same and the disk, c, with the elevator and the bail (or their equivalents) the lamp and the slide tube, b, provided with means of arresting the upward movement of such tube and applied to the wick tube, and so as to operate with respect to the wick, substantially as specified.

57,590.—HEDGE TRIMMER.—Wilson and Hiram Sperry, Trivoli, Ill.

We claim the hinged beam, d, having the knife bar attached thereto, as arranged, whereby it may be elevated or depressed by the lever, g, and vertical notched bar, h, substantially in the manner and for the purpose as herein set forth.

Second, The arrangement of the circular saw, M, and circular bar, N, in connection with the finger bars, n, arranged substantially in the manner and for the purpose as herein set forth.

Third, The application of a circular plate, M, provided with saw teeth and suitable fingers, n, arranged and operating substantially in the manner described.

Fourth, The combination of the circular plate, M, with the knife bar c, the one operating simultaneously with the other, substantially in the manner as described.

Fifth, The arrangement of the foot lever, C, on the shaft of the driving wheel, B, substantially in the manner and for the purpose as herein described.

Sixth, The arrangement of the driving wheel, B, large cog wheels, D, two smaller ones, G G, large beveled cog wheel, H, and smaller beveled one, I, on crank shaft, J, substantially in the manner and for the purpose as herein set forth.

57,591.—COMBINED SEWING-WORK HOLDER AND SCISSORS SHARPENER.—Charles E. Staples, Worcester, Mass.

I claim a combined cam-formed cloth holder for sewing purposes and a scissors sharpener, all constructed substantially as described.

57,592.—MACHINE FOR PRINTING YARN.—Edward J. Stephens and Hiram E. Green, Pawtucket, R. I.

We claim the use in machines for printing yarn of the plain roller, B, and fluted roller, B', in combination with each other, and with suitable color rollers, substantially as and for the purpose set forth.

57,593.—GRUBBING MACHINE.—W. W. St. John, St. Louis, Mo.

I claim the combination and arrangement of the roller, A, with the hounds or braces, B B, the springs, b b, and the pole, C, substantially as and for the purpose set forth.

57,594.—ARTIFICIAL ARM.—Ignatius Stoffel, Washington, D. C.

First, I claim the construction of the last or outer articulations or joints, or means of operating the outer or last phalanges, by the steel bands without the guide, substantially as shown and described.

Second, Pivoting the thumb and lever connecting therewith at the second joint, in the manner and for the purpose substantially as described.

Third, The construction, arrangement, and operation of trigger, n, in combination with levers, x x, connecting rods, h and k, substantially as described.

Fourth, The adjustable band, o, when constructed and arranged as described.

Fifth, The bent or bell-crank lever, l, constructed and arranged to operate as and for the purpose described.

Sixth, The loops or rings, s and t, when arranged as and for the purpose described.

57,595.—PUMP.—Ransom E. Strait, West Oneonta, N. Y.

I claim, in combination with the suction tube, A B, having apertures, P P, the thimble, F, with its openings, O O, constructed and operating in the manner and for the purpose set forth.

57,596.—EGG BEATER AND LIQUOR MIXER.—E. C. Strange, Taunton, Mass.

I claim the combination of the piston, C, tube or cylinder, A, and one or more perforated or wire gauze plates, B, substantially as herein described and for the purpose set forth.

57,597.—SKATE.—Wm. A. Sutton, New York City.

I claim the clamping bar, E, furnished with an inwardly projecting spur, m, when pivoted at or near the center of the heel plate, C, in combination with the adjustable bars, D, furnished with spurs, c, substantially as described.

57,598.—LADY'S FAN.—Billy Todd, Reading, Pa.

I claim a fan consisting of the handle, 1, body, 5, and spring joint, 2 3 and 4, constructed and adapted for operation substantially as described.

57,599.—EXPANDING CHEESE HOOP.—Robert Van Horn, Northfield, Ohio.

I claim the herein described devices for contracting or expanding the hoop, consisting of the strap, D, and roller, E, or their substantial equivalents, the several parts being constructed, arranged, and operating as and for the purpose set forth.

57,600.—INDIA-RUBBER CAR SPRING.—Richard Vose, New York City.

I claim springs for railway cars and other purposes, formed by the combination of disks, rings, or transverse strips or layers of elastic or non-elastic fibrous material, with india-rubber, or its equivalent, by cementing or vulcanizing the same in contact with such material, all substantially in the manner and for the purpose herein set forth.

57,601.—WASHING MACHINE.—Daniel T. Ward, Cardington, Ohio.

First, I claim the wash-board, F, constructed and arranged with reference to the vessel, A, substantially as described, and for the purposes specified.

Second, The combination of the wash-board, F, and the roller, B, substantially as and for the purpose described.

Third, The arms, S and T, roller, x, spring, u, when arranged in connection with the wash-board, F, and roller, B, substantially as and for the purpose specified.

59,602.—FLUID LENS.—Oscar Warden, Cincinnati, Ohio.

I claim the lamp, E, base, F, and reflector, T, connected and moving together, when used in combination with the guide ways, b, screw, G, segment bar, K, and plane convex fluid lens, A a, all constructed and operating as and for the purposes specified.

57,603.—WHIP SOCKET.—Theos. Weaver, Harrisburg, Pa. Antedated Aug. 13, 1866.

First, I claim the interposition of a rigid disk or disks between the inner walls of a whip socket tube, so as to lock in it the butt of a whip stock, that it cannot be removed without the use of a key, or other equivalent instrument, substantially as herein described.

Second, The construction of the locking thimble, as shown in Figs. 2 and 3, with the crescent, B, springs, R R R, and keyhole, C; also the construction of the thimble chamber, as shown in Fig. 6, with the crescent, H, the notches, X X X X' X', and key guard, O, substantially as herein set forth.

Third, The combination and arrangement of the subjects of the second claim, when the thimble is so operated by the key, shown in Fig. 7, as partially to open or close the gibbous aperture of the tube, substantially in the manner and for the purpose as herein shown and explained.

57,604.—SEED DISTRIBUTOR.—M. D., E. C. and A. Wells, Morgantown, West Va.

We claim the box, A, constructed as described, the shaft, B, provided with the slot, a, or its equivalent, block, b, strip, d, and flanges, S S, the whole constructed, arranged, and operating substantially as herein set forth.

57,605.—GRAIN-HULLING MACHINE.—J. A. Welsh, Xenia, Ohio.

I claim the combination of the feeding tube, B, and the conical end or part, s, of the drum, d, or its equivalent, the amount fed in being regulated by a gate, b, substantially as and for the purpose herein specified.

I also claim the transferring cylinders, K L M, constructed and operating substantially as and for the purpose herein set forth.

I also claim the lining of connected sand, or its equivalent, secured to the grates, F F, substantially as and for the purpose herein specified.

57,606.—CHURN.—Isaiah M. West, Wilmington, Ohio.

I claim the combination of the dasher ring, A, and aperture, d d, whether conical or not, in the dasher boards, B B, substantially as and for the purpose herein specified.

57,607.—ORDNANCE AND FIRE-ARM.—Rollin White, Bridgeport, Conn.

I claim, First, The ring, F, of larger circumference than the projectile, applied in combination with the enlarged chamber, a a, to form a seat for the projectile, and to traverse in the enlarged chamber and carry the ball to the rear of the bore of the barrel, substantially as and for the purpose herein specified.

Second, Providing the accelerating chamber constructed in the barrel of a piece of ordnance or fire-arm with vents, m, opening into the barrel in front of the muzzle of the said chamber, substantially as and for the purpose herein specified.

57,608.—HORSE-POWER APPARATUS FOR ELEVATING HAY, ETC.—Frank Wicks, Upper Sandusky, Ohio.

I claim, in combination with the sweep and hoisting or rope wheel, a clutch, and a brake lever operating therewith, substantially in the manner and for the purpose described.

57,609.—HORSE HAY FORK.—Frank Wicks, Upper Sandusky, Ohio.

I claim, First, The hinged self-acting brace, F, for setting the fork and holding it in proper carrying position under its load, substantially as described.

I also claim the combination of the hinged bail, D, its shank, E, and the brace, F, pivoted to said shank, and carrying a roller, d, as and for the purpose substantially as herein described.

I also claim, in combination with the roller, d, in the brace, and the recess, c, in the shank, C, the pivoting of the trigger a to a point behind and below said recess, so that when unrestrained it will swing out of the way, and allow the brace and its roller to find their proper setting positions, substantially as described.

I also claim, in combination with a trigger that is operated to throw the brace out of its place, by means of a cord passing over a pulley in rear of said seat, and arranged in the shank in rear thereof, the controlling devices, i i, for restricting the motion of the trigger on each side of its center of motion or pivot, substantially as described.

I also claim, in combination with the self-acting hinged brace, F, a permanent notch, stop, recess, or its equivalent, for the purpose of receiving and retaining the brace, thereby holding the fork in proper position while elevating its load, substantially as described.

57,610.—TACKLE BLOCK FOR HAY ELEVATORS.—Frank Wicks and F. F. Fowler, Upper Sandusky, Ohio.

We claim a hoisting block, the sheave of which is covered, where the rope runs in contact with it, with lead, or a composition of lead with other soft metals, for the purpose of coating or glazing an oiled rope when used therewith, and to prevent it from cutting, chafing, and wearing, substantially as described.

57,611.—STOPPINGS FOR HORSES' FEET.—Albert S. Wilkinson, Pawtucket, R. I.

First, I claim a sponge stopping, having a V-shaped recess, a, cut in its rear edge for receiving the frog of the foot, substantially in the manner and for the purpose specified.

Second, I claim an air-cushion stopping, B, substantially in the manner and for the purpose set forth.

Third, I claim an elastic pad stopping, C, of rubber constructed either solid or hollow, and secured in place by a web, D D, substantially in the manner and for the purpose set forth.

Fourth, I claim a heel flap d, attached to a web covering the sole of the foot, constructed and operating substantially in the manner and for the purpose described.

57,612.—SAWING MACHINE.—George L. Wilcox, Hebron, Conn.

I claim the arrangement of the double dog piece, M, ratchet, N, handle, O, and springs, L and P, with the guide piece, J, when arranged for joint operation, substantially as described and for the purposes specified.

57,613.—STEAM TRAP.—Joseph Wilson, Manchester, N. H.

I claim the arrangement herein set forth whereby the valve may enter and traverse in its seat, sleeve or cylinder, and thereby prevent the straining, bending, or otherwise deranging some part of the apparatus.

And in combination with a valve arranged to enter and traverse in its seat or sleeve, I claim the rod which operates the valve, substantially as described.

57,614.—EXCAVATING MACHINE.—Caleb Winegar, Union Springs, N. Y.

I claim the hinged shovel, A, operated by means of the handle C, notched bar, B, and spring, D, not confining myself to the precise arrangement, but by equivalent means, substantially the same, to accomplish the same object.

57,615.—MACHINE FOR MANUFACTURING EAVES-TROUGHS.—Samuel Yates, Clarence, Iowa.

I claim the entire combination of the half oval bar, A, the bands, B, the spiral springs, C, and each and every part of the machine, which combination greatly facilitates the process of making tin spouting for houses, lessens the labor, and secures more perfect spouting when finished.

57,616.—DOOR BOLT.—George T. Allamby, Bangor, Me.

I claim the combination of the socketed arm, f, or its equivalent, with the bolt, A, applied to the case as explained, the separate knob, C its shank, d, and the curved slot, b, made in the bolt case, the whole being arranged substantially in the manner and so as to operate as described.

I also claim the combination of the covering plate, c, the slot, b, the shank, d, the knob, C, and the socketed arm, f, as applied to the bolt and its case, the whole being arranged substantially in the manner and to operate as explained.

57,617.—MACHINE FOR MAKING ENVELOPES.—Edward Allen, Norwalk, Conn.

I claim, First, Arranging the following apparatus of an envelope machine to revolve about an upright axis, substantially as specified.

Second, The combination in an envelope machine of one or more sets of folding apparatus and stationary feed board or feed table, substantially as and for the purpose herein described.

Third, The combination in an envelope machine of one or more revolving plungers, a fixed feed table or feed board, and a die plate which moves a certain distance with the said plunger or plungers, and afterward returns to a fixed position relatively to the said feed board or feed table, substantially as and for the purpose herein described.

Fourth, The sliding pins, n and n', operating conjointly to deliver the envelopes from the folding apparatus, substantially as herein set forth.

Fifth, The nipping jaws, u' w', so arranged as to swing to and from the table, A, to remove the envelopes from the folding apparatus, substantially as herein set forth.

Sixth, The carved and inclined stationary cams, j' s u v, arranged in relation to the wings, c' d' e' f, of the folding apparatus, substantially as herein set forth for the purpose specified.

Seventh, The brake, i3, applied and operating in combination with the laterally moving die plate, H, substantially as herein set forth for the purpose specified.

Eighth, The arrangement of the pivoted bars, b3, and their pin, c3, with reference to the downwardly projecting pin, a3, and to the stationary cam, i3, to produce the lateral movement of the die plate, H, substantially as herein set forth.

Ninth, The nipping jaws u' w', swinging on a vertical axis, and arranged with reference to the rotating cam, L, bar, e'', friction roller f, and arm, N, substantially as herein set forth for the purpose specified.

Tenth, The spring, y', curved arm, x', and spring catch, b'', arranged with reference to each other and to the nipping jaws, u' w', projection, d', and stationary cam, K, substantially as herein set forth for the purpose specified.

57,618.—CAR COUPLING.—Cyrus W. Baldwin (assignor to himself, W. D. Richards, and W. E. Russell), Boston, Mass.

I claim the employment of the balanced lever, B, when made and applied substantially in the manner and to operate as before described.

I also claim, in combination with the said lever, B, the revolving block, C, and locking bar, D, substantially as set forth and explained.

I also claim the peculiar construction of the block, C, as made with the recess, d, shoulders, d1 d2, and notch, g', all as described.

57,619.—CULTIVATOR.—Jacob Bergen (assignor to himself and Peter Kaufman), Plain Township, Ohio.

First, I claim the peculiar arrangement of the bent axle, H G F G H, in connection with the frame, A, and the wheels, G, substantially in the manner and for the purpose specified.

Second, The peculiar arrangement of the back braces, E, and frame, A, in the manner and for the purpose specified.

57,620.—APPARATUS FOR TURNING SHAFTS.—John F. Bogardus (assignor to himself, Joseph Anderson, and T. K. Schermerhorn), Brooklyn, N. Y.

First, I claim the rings, c and d, divided and otherwise constructed and fitted together as described, in combination with worm wheel, f, or other equivalent means for imparting a movement of rotation to said ring, d.

Second, I claim the arrangement of the rests, k and l, and tools, i and o, with a rotating ring, substantially as described.

57,621.—PIPE WRENCH.—Amos Call (assignor to the Bemis & Call Hardware and Tool Co.), Springfield, Mass.

I claim the combination of the spring, F, with the parts H and E, of the wrench, when arranged and operating substantially in the manner and for the purpose herein described.

57,622.—REVOLVING FIRE-ARM.—Charles A. Converse and Samuel S. Hopkins (assignors to the Bacon Manufacturing Co.), Norwich, Conn.

We claim, First, The ring, D, encircling the pepper box, A, in front of its shoulder, g, in combination therewith and with screw, E, and bracket, G, arranged and operating in the manner and for the purpose herein represented and described.

Second, We also claim, in combination the base pin, F, about which the cylinder revolves, the ring, D, the many chambered cylinder, A, and the bracket, C, substantially as above shown.

57,623.—METHOD OF PROPELLING STREET CARS.—J. W. Conway (assignor to himself and Wm. Conway), Madison, Ind.

I claim the endless screw, I G, in combination with the driving or crank shaft, N, and the axle, D, of one pair of the wheels of a carriage or car, substantially as and for the purpose specified.

57,624.—STARTING CAR.—Henry H. Covert (assignor to himself and Smith R. Woolley), Detroit, Mich.

I claim the pinch bar or lever, D, one or more applied to a railroad car arranged in connection with a toggle, E, and bar, I, or

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their equivalents, for the purpose of acting upon the wheel or wheels for the purpose of starting a car under the action of the team or other motor, substantially as described.

I further claim the draw bar, K, having a spring, M, upon it and provided with the projecting rod, N, passing through a slot in the box or case, L, in connection with the notch, c, in bar, I, substantially as and for the purpose set forth.

57,625.—WAGON BRAKE.—George W. Growe (assignor to himself and Benjamin Martin), Cincinnati, Ohio.

I claim an improved wagon brake, formed by combining the lever brake bars, D, and F, the connecting lever, I, connecting rod or bar, J, and the operating lever, K, with each other, the said parts being constructed and arranged substantially as herein described and for the purpose set forth.

57,626.—ROOFING CEMENT.—Joseph Darby (assignor to himself and Stephen Brewer), Cortlandville, N. Y.

I claim an elastic cement or composition of matter composed of the aforesaid herein named ingredients, as and for the purposes herein set forth and described.

57,627.—SAW.—J. E. Emerson, Trenton, N. J., assignor to American Saw Company, New York City.

I claim the teeth, B, fitted at the back by tongue and groove joints, f g, to the shoulders, c, of the saw plate in combination with rivets, screws or keys, C, applied to the heels, c, of the teeth, when the parts are constructed and arranged substantially as herein represented, so that in inserting the teeth the shoulders, a, must be first placed in position, and the heels afterward introduced laterally to the saw plate and there secured by the rivets, C, as explained.

57,628.—BRICK MACHINE.—Henry J. Ferguson, New York City, assignor to Selah Reeve, Brooklyn, N. Y.

I claim, First, The combination of the rotating disk, J, having a center cam, h, and outer eccentric or cam-shaped ring, i, with the pitman, I, to the plunger, H, and slide, K, to the pitman, L, for operating the plunger and pusher, substantially as described.

Second, The combination of the disk, J, with its radial slide, f, pitman, I, and plunger, H, adjustably connected as described through a slot in the standard, c, by keys, d, fitting in key ways or grooves, c, as herein set forth.

Third, The slotted levers, R S, pivoted together by joint pins, p, fast and loose collars, q r, bosses, s, and lock nuts, t, substantially as specified.

Fourth, The combination of the pitman, L, with the arm, P, on the rock shaft, Q, geared together by a joint pin, u, arranged to fit in a notch at the back of the pitman and held in gear therewith by a catch, w, and spring, z, essentially as and for the purpose or purposes herein set forth.

57,629.—BREAST STRAP HOOK.—Henry Foulkes, Utica, N. Y., assignor to John H. Chapman.

I claim the securing or closing the opening of the hook by the use of a screw in the manner substantially as described.

57,630.—HYDRAULIC GOVERNOR.—James E. Gillespie (assignor to Gillespie Governor Company), Boston, Mass.

I claim the combination of a governing device with the cylinder, d, its piston, f, and the spring, n, or the equivalents of these, when arranged to operate together, substantially as specified.

Also, in combination with the foregoing of a passage capable of variation, when so arranged as that by such variation the rate of speed of the movement of the piston, under influence of its spring, may be changed.

Also, combining a governor and the object governed thereby, in such a manner that, while the connection between the governor and the governed object can be broken to prevent movement of the latter in one direction, the connection causing movement of the governed object in the reverse direction remains operative, substantially as shown and described.

57,631.—MACHINE FOR BENDING HORSESHOES.—William F. Goulding, Providence, R. I., assignor to The Goodenough Horseshoe Company, New York City.

I claim, First, The revolving flat bed or table, B, provided with suitable forming blocks, G, and guides, b b, in combination with suitable stationary bending instruments, F F, arranged substantially as described, for the purposes specified.

Second, The combination of the stationary finger, H, with the forming block, G, and the said revolving bed, B, arranged substantially as described, for the purposes specified.

57,632.—BUCKLE.—Henry C. Griggs (assignor to Smith & Griggs), Waterbury, Conn.

I claim the combination of the frame part with the tongue part, when they are constructed, connected, and fitted to operate, substantially as herein described and set forth.

57,633.—LIFE BOAT.—Henry Hensel (assignor to Louis Sulter), Carver, Minn.

I claim the air chambers, G and H, surrounding the self-adjusting cylinder boat, A, operating independently on the center shaft, J, arranged and combined with end propellers, K, for the purpose of steering and turning the boat quickly, at the same time preventing the boat from sinking, giving the greatest safety to the passengers as a buoyant life boat.

57,634.—PRINTING PRESS.—George J. Hill, Buffalo, N. Y., and Stephen Greene, Philadelphia, Pa., assignors to Stephen Greene and H. G. Leisenring, Philadelphia, Pa.

We claim, First, The vibrating cam levers, constructed and arranged for the operating of a guided cross-head, D, substantially as herein set forth.

Second, The guides, M M', composed of plates constructed and arranged for vertical self-adjustability to suit cards differing in thickness and for the retention and guidance of the cards, substantially as set forth.

Third, The combination of the said guides, M M', with the ticket or card box, N.

Fourth, The movable receiving box, N', where the vertical position of the same is controlled by the quantity of cards in the box, N through the medium of the devices herein described or any equivalent to the same for the purpose specified.

57,635.—PUMP.—Edward B. Juckett, Roxbury, Mass., assignor to himself and Hunneman & Co.

I claim my improved double acting force pump, or peculiar arrangement of the valve chambers, D D G, the induction chambers or passages, E F, and the pump barrel, A, as described, such valve or chambers to be provided with valves, and valve openings, and such barrel to have a piston to operate as specified.

57,636.—MAGAZINE FIRE-ARM.—Nelson King, Bridgeport, Conn., assignor to O. F. Winchester.

I claim the arrangement of the retracting hook, a2, with its sleeve, d2, upon the breech pin, L, so as to retract the cartridge or shell, substantially in the manner herein described.

57,637.—STEAM GENERATOR.—Charles Kinkel, New York City, assignor to Charles Wehle, Hoboken, N. J.

I claim the new method herein described for preventing explosions of steam boilers, by a combination of a steam boiler with the mechanism substantially as described, which keeps the water in the boiler in constant and regular motion.

57,638.—HAT-PRESSING MACHINE.—Monroe Morse (assignor to himself and Aaron H. Morse), Franklin, Mass.

I claim the combination as well as the arrangement of a solid elastic presser with the mold, its head, and mechanism for expanding such presser by pressure against it, substantially as specified.

I also claim the application of the head, C, to the mold by means of centers, as described, so that such head, while being withdrawn from the mold, shall be brought into an inclined position in order to facilitate the application of a hat to the presser.

I also claim the combination of the bar, G, the slides, I I, and their pins, with the toggles or progressive levers, o p q q r, and the foot lever, s.

I also claim the combination and arrangement of bolts, w w, catches, v v, and levers, y y, applied to the mold and the vibrating head, as described.

I also claim the combination of the adjusting screw, g, and its nuts, i i, with the bar, G, the vibrating head, C, and disk, E, and presser, D.

57,639.—APPARATUS FOR CARBURETING AIR.—James F. Rowley, William M. Sloane, and James E. Woodruff, Buffalo, N. Y., assignors to themselves and John D. Cross.

We claim an apparatus for carbureting air or gas, having a reservoir, B, for hydro carbon, a lime chamber, D, and chambers, E and F, containing porous substance, all arranged and constructed in the manner and for the purpose substantially as herein set forth.

57,640.—PLATFORM SCALE.—Elnathan Sampson, Lansingburgh, N. Y., assignor to Alfred Clark Hitchcock, Troy, N. Y.

First, I claim the location, under the platform of a scale, of a series of bell crank levers, E, with yokes, F, and suspension links, c c, which connect said yokes with co-operating and connecting parts for supporting the platform of the scale, substantially as herein described and for the purpose set forth.

Second, I claim the arrangement of a series of bell crank levers with their long arms in upright position below, and placed transversely to the length of the platform, or to the trackway over the platform of the scale, substantially in the manner as herein described and for the purpose set forth.

Third, When arranged in combination with the lever, E, with the yoke, F fulcrum standard, D, and platform timbers, B B, I claim the supporting plate or frame, J, or its equivalent device, constructed and arranged substantially in the manner and for the purposes herein set forth.

Fourth, I claim the arrangement, relatively to and with each other, and with the platform timbers, of the respective bell crank levers with yokes, supporting plates or frames, and fulcrum standards, as herein described, when the same are so connected with each other by connecting parts as to operate together for the purposes of a platform scale, substantially in the manner as herein described.

57,641.—WEIGH-LOCK SCALE.—Elnathan Sampson, Lansingburgh, N. Y., assignor to Alfred Clark Hitchcock, Troy, N. Y.

First, I claim the combination of the bell crank lever, F, and the direct sustaining levers, C and C', when said sustaining levers are arranged in horizontal parallel positions to the side walls of the lock chamber, substantially as described, and for the purposes as set forth.

Second, Arranged in connection with the bell crank levers, F F, in manner as described, I claim the combination of the bell crank levers, c c', and transmitting lever, i, substantially as and for the purpose herein set forth.

Third, I claim connecting the devices arranged on opposite sides of the lock chamber, and constituting a weighing apparatus for weigh-lock scales, by arranging the mechanical means employed for that purpose under the floor of the lock chamber, in manner substantially as herein described, and for the objects as set forth.

Fourth, Arranged and connected with the bell crank levers, F F, in manner as described, I claim the combination of the bell crank levers, t t', with the bell crank connecting lever, s', for the purpose of transmitting the weight of the vessel resting upon the cradle, to the scale beam, in manner substantially as herein described.

Fifth, In combination with the bell crank levers, c c', and transmitting lever, i, the manner herein described of connecting the weighing apparatus of the opposite sides of the lock chamber, and the bell crank levers, t t' and s, all arranged with reference to each other, substantially as herein set forth, I claim the arrangement of the said direct sustaining levers, for the purpose of a weight-lock scale, in manner substantially as herein described.

57,642.—VENTILATED LARDER.—John Sloan (assignor to himself and John W. Jones), Philadelphia, Pa.

I claim the combination of box, A A, air pipe, K K, and discharge pipe, K' K', charcoal box, A A', with larder, F F, in the manner as herein described, or any other, and substantially the same, so as to obtain the desired and intended effect.

57,643.—STEAM-GENERATING APPARATUS.—Scott A. Smith (assignor to himself, G. V. Cresson, and George W. Hubbard), Philadelphia, Pa.

I claim the method substantially as described, of constructing a steam generating apparatus by combining a series of annular generating vessels with a bottom connecting reservoir.

57,644.—MACHINE FOR MAKING CAST-STEEL CASTINGS.—John Blake Tarr (assignor to himself and P. E. Merrihew), Chicago, Ill.

I claim, First, subjecting the cast-steel, while in a liquid state, and within the mold which is to give it the desired form, to such a degree of pressure as will cause the expulsion of air and gas from it and render it more solid, by means substantially as described.

Second, Constructing the bottom of the mold at those points which are directly under the ingates, of adjustable blocks of plumbago, or other analogous substance, substantially in the manner and for the purpose described.

Third, The manner, substantially as herein described, of constructing the ingates with cutters on them, when said ingates are applied and operated as described for the purpose set forth.

Fourth, The use of adjusting screws in conjunction with mold sections, A B C, and the hooks, g h, or their equivalents, substantially as described.

57,645.—SAFETY WATCH POCKET.—T. W. Terry (assignor to himself and Geo. W. Hoff), Baltimore, Md.

I claim the combination of the plates, A B, hinged staple, c, and button, e, constructed and operating substantially as and for the purpose described.

57,646.—TEMPLE FOR LOOM.—George L. White, Cumberland, R. I., assignor to W. W. Dutcher & Co., Milford, Mass.

I claim the combination of the tooth, g, and the notch, f, or their mechanical equivalent or equivalents, with the temple, its arm, D, spring, F, and frame, E, the said tooth and notch being for the purpose hereinbefore explained.

57,647.—OPERATING INDIA-RUBBER SPRINGS.—J. W. Wilder (assignor to himself and Ebenezer Butterick), New York City.

I claim the protecting case, B, and plunger, C, in combination with a piece of india-rubber, A, substantially as and for the purpose described.

57,648.—PISTON FOR STEAM ENGINE.—Geo. Browcr, Ashton under Lyne, England, and John Quatter, Barnsley, Eng.

We claim, in combination with springs composed of a series of plates, the wedges, e, and wedge pieces, d', combined, and arranged to operate in the manner and for the purpose substantially as herein described.

57,649.—BLEACHING ANIMAL AND VEGETABLE FIBERS.—C. M. E. du Motay and C. R. Marechal, Metz, France.

We claim, First, the method of bleaching vegetable and animal fibers and tissues by the employment of manganates, permanganates, and permanganic acid, substantially as herein described.

Second, The method of producing the said manganates and permanganates, substantially as herein shown and described.

57,650.—LUMBER WAGON.—C. F. Hall, Toronto, Canada West.

I claim the roller A, with perforated projecting ends, the perforated plate, E in combination with the boxes, B, of the running gear of wagon, provided at its forward end with rollers, G and bearings, H, all constructed and operating substantially as described for the purpose specified.

57,651.—MODE OF PRODUCING ETCHING GROUNDS.—R. Gotigetreu, Munich, Bavaria, assignor to Lenneig & Clemm, Philadelphia, Pa.

First, I claim the entire process, as above, preparatory to etching the design or designs on plates or surfaces of any description, said designs being produced by crystallization of solutions.

Second, I claim the process of using crystallizing solutions for the production of images on surfaces that can be etched, in the usual method of engraving.

57,652.—STEAM PLOW.—John Fowler, Jr., Cornhill, England, Wm. Worby, Ipswitch, Eng., and David Greig, New Cross, Eng., assignors to Wm. P. Tatham, Philadelphia, Pa.

We claim, in machinery for actuating agricultural implements by steam power, combining the two drums, which alternately wind up and let off the rope by which the agricultural implement is drawn, with the driving shaft of the steam engine, or equivalent motor by means of the cogged or toothed wheels on the drums, the two sets of pinions on the driving shaft, and the clutches and friction straps or the equivalents thereof, substantially as and for the purpose specified.

57,653.—STEAM PLOW.—Robert Fowler, London, Eng., and Robt. Wm. Eddison, Leeds, Eng., Executors of John Fowler, Jr., David Greig, and Richard Noddings, Leeds, Eng., assignors to William P. Tatham, Philadelphia, Pa.

We claim, in guiding the laying of the rope on to the periphery of the drum, in machinery for drawing agricultural implements by steam power combining the guiding lever for guiding the rope with the flanched drum for drawing and winding the rope by means of the cam and differential wheels, substantially as described and for the purpose specified.

We also claim connecting the guiding lever with the winding drum, so that in addition to having an up and down motion to lay the rope properly on the face of the drum, its guiding end shall be free to revolve around the dram, and thus adapt itself to the angle at which the rope may be hauling, substantially as described.

57,654.—BURGLAR ALARM AND DOOR FASTENER.—Frederick Oakley, London, Eng., assignor to John Collins, New York City.

I claim, First, The revolving eccentric block, k, with pins, l, attached to t, in the manner and for the purpose herein shown and described.

Second, The combination of the barrel or powder chamber, f, with the set screw, g, nipple, e, and bars, A and B, substantially as herein shown and described.

57,655.—METHOD OF TEMPERING KNIFE SECTIONS FOR HARVESTERS, ETC.—Asa R. Reynolds, Auburn, N. Y.

First, I claim hard tempering the edges of steel blades or sections by means of a blow from a hammer or drop press delivered under conditions and with a reaction, substantially such as herein described.

Second, I claim supporting the blade, section, or blank, to be hard tempered by a drop die or hammer, upon or by its edges, upon an under die, having inclined or sloping faces, substantially as herein described.

Third, I claim means for forcing or directing a blast of air upon that portion of the blade which is not to be highly tempered, when used in connection with a hammer or drop press conditioned for giving a blow and for reaction, substantially as herein described.

REISSUES.

2,342.—GAS-PIPE JOINT.—Henry L. Case (Administrator of the Estate of Richard C. Robbins, deceased), Henry L. Case, and Jesse M. Keen, Jersey City, N. J., and John W. Mason, Brooklyn, N. Y., assignees of said Richard C. Robbins, deceased. Patented Jan. 13, 1863.

Claims a joint for gas and other similar pipes, constructed in the manner herein above described, that is to say, the socket end of a length or section of pipe, having a groove formed in it capable of retaining the packing in three directions, as set forth a packing ring of soft metal being cast into the said groove and the plug end or entering end of the adjoining length or section of pipe being made conical and driven into the packing, substantially as hereinbefore described; and the said joint being composed of three parts only, as set forth.

2,343.—PUMP.—William D. Hooker, San Francisco, Cal. Patented Aug. 15, 1865.

I claim a vertical and inclined partition, h, in combination with the suction valve seats, c1 c2, and discharge valve seats, d1 and d2, and the valves, a1 a2 b1 b2, the whole arranged as described and for the purpose specified.

2,344.—METALLIC SHIELD FOR BREAST STRAPS.—Martin W. Pond and Henry E. Mussey, Elyria, Ohio, assignors to Martin W. Pond. Patented Sept. 6, 1864.

We claim, First, The seat, f, and base of horns, d d, the same being constructed and operating in the manner and for the purposes substantially as specified.

Second, The curved metallic slide, having curved metallic horns, as described, in combination with the projections or base of horns forming the clamping seat, f, of the shield, the whole being constructed in the manner and for the purpose described.

2,345.—BAG FRAME.—Albert J. Sessions, Bristol, Conn. Patented June 12, 1866.

I claim slitting or punching the strip, substantially as described, so as to form the side and rim of the corner or corners of a frame in one piece of metal.

I also claim forming the inside corners square at a, substantially as described.

Third, Forming the inside corners of a bag frame square, while the outside corners are flattened, curved, or rounded, by means substantially as described.

2,346.—REFRIGERATOR.—Peter A. Vogt, Buffalo, N. Y. Patented May 22, 1866.

I claim the door, D, constructed as described, combined and arranged with the rack, f f, of the ice compartment, so as to turn down and form a platform in continuation thereof, for introducing and removing ice from the chamber, B, substantially in the manner specified.

I also claim the arrangement of the induction air passage through the drip pipe, l, and extension pipe, m, in combination with the trap, k, or its equivalent, whereby the air entering is carried to the top of the ice chamber and cooled in its passage, substantially as set forth.

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THE MARKETS.

The fall trade has not yet fairly commenced. Money is plenty, and the recent disbursements from the Treasury, and the influx of specie from Europe, serve to encourage speculation, which, however, is checked by the continuance of full prices and the lessened demand for exports. Business generally is gradually reviving, and there is a fair show for a steady and increasing demand for most of our staple productions. The prospects of the money market are fair, and the increased demand for our Government securities abroad encouraging.

GOLD—At last quotations. Money is obtained on call at 4@5 ₱ cent. Discount at about 6 ₱ cent.

ASHES—Pots are quite dull, but with continued light receipts, market steady. Pearls are nominal.

BRICKS—Common Hard, $12@13. Croton and Philadelphia are unchanged at $14@$15 for the former, and $40 for the latter.

COFFEE—Slight advances for lower grades of Rio.

COPPER—Detroit, 31@31½; Portage Lake, 31.

COTTON—Prices unchanged, although the demand is more brisk. Ordinary, 25@28; middling, 33@37c.

FLOUR—Slight advance. Common brands, $8 55@$9 85; Genesee extra, $10 25@$12 50; Canada not in demand.

GRAIN—Wheat advanced slightly. Milwaukee, $2 25@$2 37 Amber, $2 75; North Carolina Red, $2 86. No exports. Rye, Western, 81c; Corn, declined 1¼ cents. Oats 30@44 Chicago; 45@47 Milwaukee; 57 Delaware.

IRON—Market dull. No. 1 American pig $47@$48. Scotch, $47@$50. Bar and scrap very quiet.

LATHS—Are firm, with sales of Eastern at $4, three months.

LEAD—Pig is steady, with a fair demand; sales about 400 tons ordinary Foreign at 6¾@7 cents gold. Bar is steady at $10 50, and Sheet and Pipe $10 70₱100lb net cash.

LEATHER—The market for Hemlock Sole continues dull, and prices are very firm. We quote Rio Grande and Buenos Ayres Light Weights, 33@34 cents; Middle do., 35@36; Heavy do., 36@37; California Light, 31@32; Middle do., 33½@34½; Heavy do., 34@35; Orinoco, &c., Light, 31@32; Middle do., 33@34; Heavy do., 29@32; Slaughter Upper in Rough, 31@33. Oak Sole is in light stock, and the market is firm. French and American Calf Skins are firm with a fair demand.

LIME—No transactions. Rosendal Cement, $1 75, cash.

LUMBER—Eastern Spruce lower, with sales at $22@22 50.

MOLASSES—The market continues dull, and is still weaker than before, prices ruling in favor of buyers. The sales are 273 hhds. and 28 tcs. Porto Rico, and 287 hhds. English Islands, on terms not made public; 20 Guadalupe, 55cts.; 50 hhds. and 1 bbl. Cuba Muscovado, 51; 33 hhds. Clayed do., 45; and 50 bbls. Texas 80, four months. By auction, 200 bbls. New Orleans sold at 65cts; and 10 hhds. Porto Rico, 67, cash. The stock is about 5,750 hhds. Porto Rico, 6,200 Cuba, etc., and 100 bbls. New Orleans.

NAILS—Cut are very firm and scarce, with a tendency to advance; some sizes are scarce, and for these ¼ cent more is paid. We quote: Cut, 6¾@7 cents; Clinch, 8¼; Forged Horse, 32 Pressed do., 22@24; Copper, 50; Yellow Metal, 33; Zinc, 20; and Wrought Ship and Boat Spikes, 7@8 cents, as to sizes, net cash.

SUGAR—Prices have favored buyers, and we have to notice an advance of ¼ of a cent ₱ lb on Refining grades, bringing Fair Refining Cuba to 10¾@11 cents; Good, do., to 11@11½; and No. 12 Box to 11¾@11¾, 4 mos. Grocery grades are without particular change, but are the turn dearer. Refined continues in good demand, but is less active than before. Messrs. Stuart quote their best Crushed, Granulated, and Ground, 16 cents; White A, 15⅝; and Yellow C, 15⅛.

WIRE—Telegraph, 9c.@10c. for Nos. 7 and 11, and for hoop skirt, 55c. for No. 18 covered, and 35c. for uncovered.

WOOL—Market unsettled. Western Fleeces at 48@50c. for low grades, 55 for ordinary, and 65@72½for choice—the latter price for Ohio pic klock; super and extra pulled, 53@65; short staple at 35; Texas, 15@18 for inferior, 20@24 for ordinary, and 25@30 for superior.

ZINC—9½c. less 4 per cent. for gold; 13½c., currency, for Lehigh.

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PRELIMINARY EXAMINATION AT THE PATENT OFFICE

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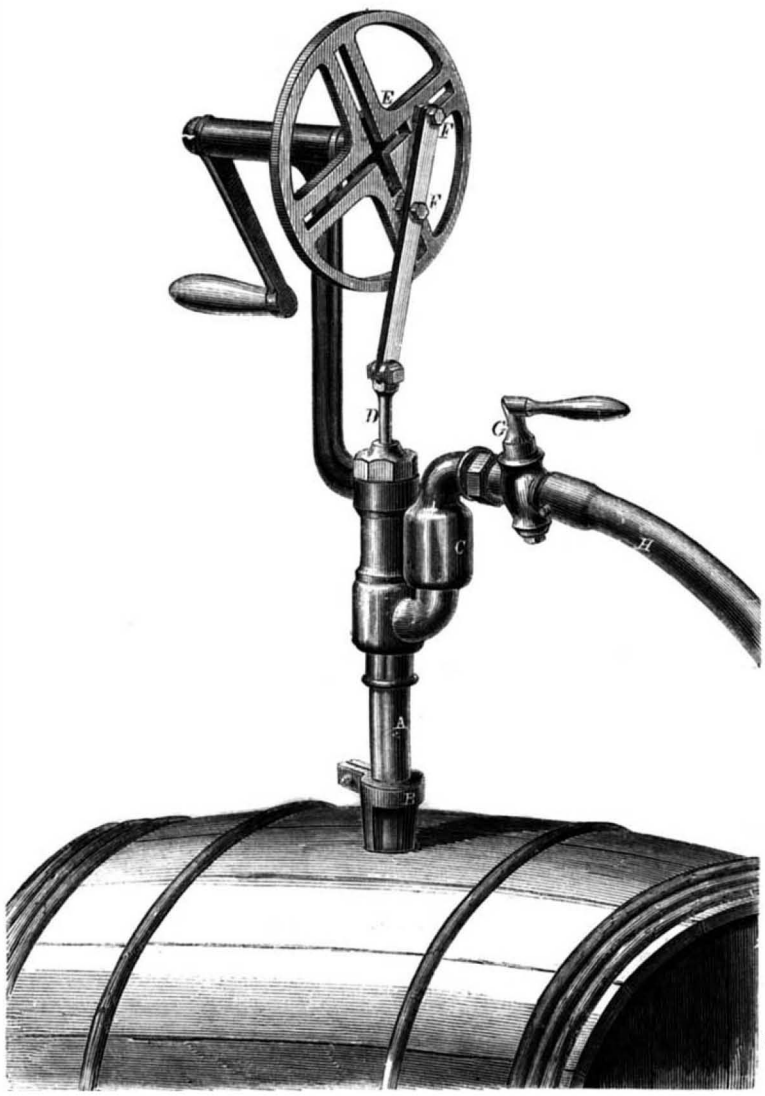
Portable Liquor and Transfer Pump.

Those accustomed to the common barrel transfer pump will see at once the value of the improvement herewith illustrated. The direct application of the hand to the reciprocating motion of the piston of the ordinary pump is very trying to the muscles of the arm. It is claimed for this improvement that the use of this pump is far less wearying, and that it does the same amount of work in one-third the time. It is light, portable, and durable, and not liable to get out of order.

A is the pipe of the pump, which can be made of any length. It is furnished with studs at its lower end, which steady it in the barrel, and keep the bottom from the inner surface of the cask. At the bung hole it is secured by the enveloping wedge, B, which is fastened to the pipe by a set screw cramping it snugly. C C contain the valves. The plunger, D, is worked by the "slosh wheel," E, which gives two strokes of the plunger at every revolution, by means of the sliding boxes, F, working in their respective slots. G is a stop cock to which the hose, H, is attached.

This improvement was patented July 17, 1866. The entire patent right is for sale by Tully & Reece, 235 Dock street, Philadelphia, Pa.



TULLY & REECE'S LIQUOR AND TRANSFER PUMP.

A Blowing Cave.

There is a natural curiosity in Georgia, known as the "Blowing Cave." It is situated on the plantation of Colonel David Barrow, Decatur county, Ga., twenty-seven miles from Thomasville, the termiuus of the Savannah and Gulf Railroad. The cave is at the bottom of a small natural basin (whose diameter at any point will not exceed thirty feet), in a perfectly smooth plain, and surrounded with a dense copse of wood. From the mouth of this cave issue strong currents of air, with a continuous roar that is heard seventy yards off. At certain hours of the day, a hat or vail, or other light objects thrown at it, are blown six or seven feet high into the air, and at other hours of the day, with a suction relatively great, the mouth of the cave draws in any such article placed near it.

Elastic Cartridges.

M. Seguier recently read an interesting paper to the French Academy of Sciences on a modification effected on rifles by a Belgian manufacturer. Several breech-loading rifles, of different calibers, were produced, the cartridges for which were so contrived as successively to conquer the inertia of the projectile by means of the gradual compression of an elastic body inserted between the powder and the missile, which consists of a steel cylinder rounded off at the top. M. Seguier also produced a plate of soft iron, 14 millimetres (about half an inch) in thickness, shot through and through at a distance of 100 meters, a bullet weighing 45 gms. and a charge of 6½ gms. of fine gunpowder; also a steel plate 29 millimetres, or more than an inch thick, likewise shot through at a distance of 100 meters, with a projectile weighing 125 gms. and a charge of 55 gms. of powder; the missile being in each case so constructed as to have its center of gravity placed far beyond the middle, and the powder being fired at the top of the cartridge just below the bullet, by means of the explosion of a percussion cap placed inside, and struck by an air-tight piston. The elastic body placed between the charge and the bullet consists of several disks of felt, those nearest the middle being impregnated with a solution of fatty substances. The importance of this elastic wadding cannot be underrated, since, if its length be diminished, the recoil will increase and the balistic effect will diminish in proportion. Its presence also does away with the fire which accompanies the explosion at the muzzle, and which is replaced by a line of whitish smoke; the report loses its shrillness, and becomes more like the boom of a piece of ordnance. M. Seguier concluded with requesting the Academy to open a sealed packet he had handed in on the 19th of March, 1849; this being done, it was found that M. Seguier had at that period entertained the idea of placing an elastic substance (vulcanized india-rubber) between the ball and the cartridge.—*Mechanics' Magazine.*

Improvement in Fire Engines.

An improvement in fire engines has been recently tested by H. J. Johnson, of Providence, the object of which is to retain the water in the hose at full pressure when the engine ceases working. A faucet is attached to the nozzle, which shuts back the water whenever desirable, and the extra pressure operates upon a delicately-adjusted valve, in an attachment to the engine, and which in fact becomes a part of it, which opens and permits the water to flow back into the engine. This relieves both hose and engine from any extra pressure. The engine continues working as long as may be desirable, the water in meantime circulating through the valve, which ceases the instant the nozzle is opened and the water begins to flow through the hose.

LIFE PRESERVER.—Mrs. Edson, of Cambridge, Ill., has patented a very convenient life preserver, which deserves notice. It is easily inflated, and is so constructed that when the air is expelled, the preserver collapses, and can be carried in the pocket.

WHITE'S MOP WRINGER.

Mopping floors is at best an unpleasant and dirty job. The long-handled mop saves much labor and prevents much fatigue, but the strain on the muscles of the wrist in wringing the mop is considerable. The simple device here illustrated is a successful attempt to relieve the housewife of a portion of the annoyances of house cleaning.

It consists of a light wooden frame, the ends curved to correspond with the circumference of the pail, and is secured to the pail by means of a cam

lever under one of the cross pieces. A roller, A, turns on journals in the frame, and another, B, revolves in a supplementary frame, C, pivoted at D. Spiral springs affixed to the frame at D raise the pivoted frame and uncover the pail. When the mop is to be removed from the pail the frame, C, is pressed down by the foot, and held in position as the mop is drawn through the rollers. The attachment can be fixed permanently to a pail, or detached and used on any proper vessel.

For further information address J. F. White, Brattleboro, Vt.

IN 1865 there were coined at the British Mint 1,450,238 sovereigns, 1,834,750 half sovereigns, 1,580,040 florins, 5,619,240 shillings, 1,631,520 sixpences, 4,158 fourpences, 1,746,888 threepences, 4,752 silver twopences, 7,920 silver pence, 8,601,600 bronze pence, 8,064,000 halfpence, and 4,659,200 farthings. The halfpenny is the coin of which the largest number has been issued in the last ten years; in that time more than 153,000,000 of halfpennies have been coined.

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INVENTORS, MANUFACTURERS.

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